

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

2006 TRANSMISSION**Automatic Transaxle - 4T80-E - Overhaul - DTS****SPECIFICATIONS****FASTENER TIGHTENING SPECIFICATIONS****Fastener Tightening Specifications**

Description of Usage	Ref No.*	Qty	Size	Specification	
				Metric	English
Accumulator Housing	956 or 957	5	M6x1.0x20.0	8-14 N.m	6-10 lb ft
Accumulator Housing to Channel Plate	534	1	M6x1.0x20.0	8-14 N.m	6-10 lb ft
Accumulator Housing to Channel Plate	951	1	M6x1.0x50.0	8-14 N.m	6-10 lb ft
Accumulator Housing to Channel Plate	952	3	M6x1.0x28.0	8-14 N.m	6-10 lb ft
Accumulator Housing to Channel Plate	954	1	M6x1.0x25.0	8-14 N.m	6-10 lb ft
Bottom Pan to Case	62	16	M6x1.0x17.0	10-12 N.m	8-9 lb ft
Case Cover to Case	46	8	M8x1.25x14.0	20-27 N.m	15-20 lb ft
Case Cover to Case	47	2	M8x1.25x14.0	27-31 N.m	20-23 lb ft
Case Cover to Case	49	1	M8x1.25x14.5	27-31 N.m	20-23 lb ft
Case Cover to Case	50	11	M8x1.25x14.0	27-31 N.m	20-23 lb ft
Case Cover to Case (Stud)	45	1	M8x1.25x14.8	20-27 N.m	15-20 lb ft
Case Cover to Case (Stud)	67	2	M6x1.0x21.0	27-31 N.m	20-23 lb ft
Case Cover to Driven Sprocket Support	48	3	M8x1.25x17.0	20-27 N.m	15-20 lb ft
Case Extension to Case	128	4	M10x1.5x35.0	50-55 N.m	37-40 lb ft
Case Extension to Case	129	1	M8x1.25x30.0	20-27 N.m	15-20 lb ft
Case Extension to Case (Stud)	127	1	M10x1.5x35.0	50-55 N.m	37-40 lb ft
Case to Forward Clutch Support	5	2	M8x1.25x16.0	25-27 N.m	19-20 lb ft
Channel Plate to Accumulator Housing	534	1	M6x1.0x20.0	8-14 N.m	6-10 lb ft

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Channel Plate to Case	534	2	M6x1.0x20.0	8-14 N.m	6-10 lb ft
Channel Plate to Case	958	15	M6x1.0x20.0	8-14 N.m	6-10 lb ft
Channel Plate to Case (Nut)	955	2	M8x1.25	8-14 N.m	6-10 lb ft
Channel Plate to LCVB	534	9	M6x1.0x20.0	8-14 N.m	6-10 lb ft
Cooler Connector to Cooler (Case Cover)	38	-	-	20-27 N.m	15-20 lb ft
Cooler Connector (Return) to Case	3	1	-	25-29 N.m	19-21 lb ft
Detent Lever to Roller Assembly	26	1	M6x1.0x35.0	8-14 N.m	8-10 lb ft
Differential to Final Drive Carrier	119	-	M10x1.0x35.0	70-76 N.m	50-56 lb ft
Drive Sprocket Support to Case	404	6	M6x1.0x14.0	11-13 N.m	8-9.5 lb ft
Input Speed Sensor to Case	15	1	M6x1.0x	11-13 N.m	8-9.5 lb ft
Internal Mode Switch (IMS) to Channel Plate	939	3	M5x1.0x14.0	8-14 N.m	8-10 lb ft
LCVB to Channel Plate	940	4	M6x1.0x35.0	8-14 N.m	6-10 lb ft
LCVB to Channel Plate	938	3	M6x1.0x40.0	8-14 N.m	6-10 lb ft
Manual Shaft to Detent Lever (Nut)	18	1	M6x1.5	27-34 N.m	20-25 lb ft
Oil Drain-Bottom Pan to Case	8	1	1/8 27NPTF	8-14 N.m	6-10 lb ft
Oil Test-#40 TORX(R) (Case Cover)	40	-	-	18-26 N.m	13.5-19 lb ft
Oil Transfer Plate to Case	534	8	M6x1.0x20.0	8-14 N.m	6-10 lb ft
Pressure Control Solenoid Bracket to UVCB	15	1	M5x1.0x12.5	11-13 N.m	8-9.9 lb ft
Pump Assembly to Case	229	3	M5x1.0x17.0	11-13 N.m	8-9.9 lb ft
Pump Assembly to Case	231	2	M6x1.0x19.5	11-13 N.m	8-9.9 lb ft
Pump Assembly to Case Cover	232	5	M6x1.0x13.25	11-13 N.m	8-9.9 lb ft
Pump Assembly to Case Cover	233	5	M6x1.0x19.0	11-13 N.m	8-9.9 lb ft
Scavenge Lube to Case	15	1	M6x1.0x	8-14 N.m	8-10 lb ft
Scavenger Pump Cover to	226	3	M6x1.0x20.0	11-13 N.m	8-9.9 lb ft

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Scavenger Pump Body					
Secondary Pump to Case Cover	234	1	M6x1.0x28.0	11-13 N.m	8-9.9 lb ft
Secondary Pump to Case Cover	235	2	M6x1.0x16.0	11-13 N.m	8-9.9 lb ft
Secondary Pump to Case Cover	331	1	M6x1.0x40.0	11-13 N.m	8-9.9 lb ft
Servo Cover to Case	534	3	M6x1.0x20.0	11-13 N.m	8-9.5 lb ft
Side Cover to Case	28	8	M8x1.5x15.0	50-55 N.m	37-40 lb ft
Side Cover to Case	32	1	M6x1.5x15.0	20-27 N.m	15-20 lb ft
Side Cover to Case (Stud)	66	1	M8x1.5x15.0	50-55 N.m	37-40 lb ft
Speed Sensor to Case Extension	131	1	M6x1.0x11.8	8-14 N.m	6-10 lb ft
Temperture Sensor	350	1	-	3.4 N.m	30 lb in
UCVB to Case	229	1	M6x1.0x15.0	11-13 N.m	8-9.9 lb ft
UCVB to Case	331	5	M5x1.0x40.0	11-13 N.m	8-9.9 lb ft
UCVB to Case Cover	329	1	M5x1.0x50.0	11-13 N.m	8-9.9 lb ft
UCVB to Case Cover	330	2	M5x1.0x39.0	11-13 N.m	8-9.9 lb ft
UCVB to Driven Sprocket Support	331	6	M5x1.0x40.0	11-13 N.m	8-9.9 lb ft
* Reference Number refers to the callout number on the disassembled view.					

FLUID CAPACITY SPECIFICATIONS

Fluid Capacity

Application	Specification	
	Metric	English
Bottom Pan Removal (requires drain plug removal)	7.0 liters	7.4quarts
Complete Overhaul (with existing converter)	12.0 liters	12.6 quarts
Dry	14.2 liters	15.0 quarts

COMPONENT LOCATOR

DISASSEMBLED VIEWS

2006 Buick Lucerne CXS

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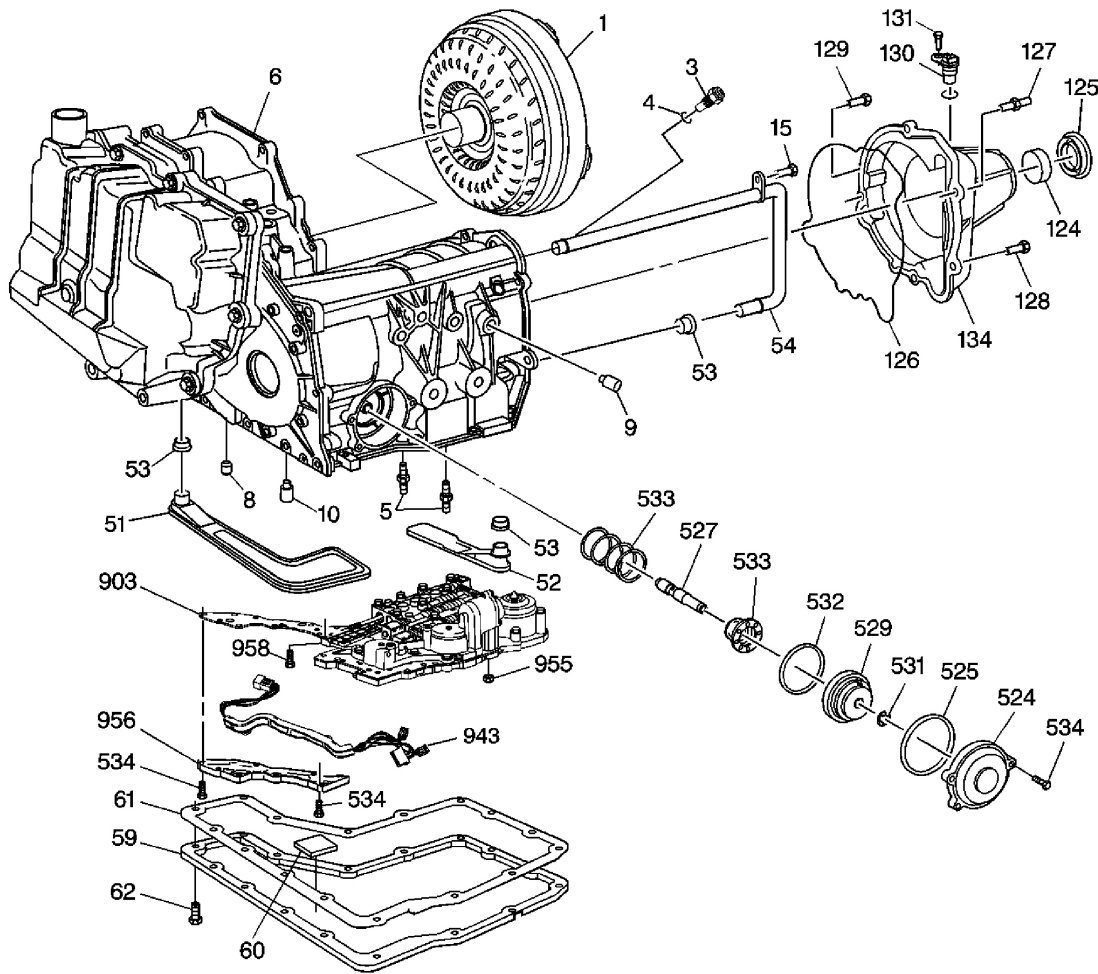


Fig. 1: Case and Associated Parts (1 of 3)
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 1

Callout	Component Name
1	Torque Converter Assembly
3	Quick Disconnect Cooler Connector (1, 19 mm)
4	Quick Disconnect Cooler Connector O-Ring
5	Stud, Case to Forward Clutch Support (2, 13 mm)
6	Transmission Case
8	Plug, Oil Drain - Bottom Pan to Case Cover
9	Pin, Anchor (Low/Reverse Band)
10	Pin, Anchor (4th Band)
15	Bolt (4, 8 mm)

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

51	Screen, Scavenge (Left)
52	Screen, Scavenge (Right)
53	Seal, Scavenge Tube and Screens
53	Seal, Scavenge Tube and Screens
53	Seal, Scavenge Tube and Screens
54	Tube, Scavenge
59	Pan Transaxle Oil
60	Magnet, Chip Collector
61	Gasket, Oil Pan
62	Bolt, Bottom Pan to Case (16, 10 mm)
124	Bushing, Case Extension
125	Seal, Axle to Case Extension
126	Seal, Case Extension to Case
127	Stud, Case Extension to Case (1, 15 mm)
128	Bolt, Case Extension to Case (4, 13 mm)
129	Bolt, Case Extension to Case (1, 10 mm)
130	Sensor, Speed Output Assembly
131	Bolt, Output Speed Sensor (1)
134	Extension, Transmission Case
524	Cover, 4th Servo
525	Seal, Servo Cover
527	Pin, 4th Servo
529	Piston, 4th Servo
531	Ring, Snap
532	Seal, 4th Servo Piston
533	Spring and Retainer Assembly, 4th Servo
533	Spring and Retainer Assembly, 4th Servo
534	Bolt, (23, 10 mm)
534	Bolt, (23, 10 mm)
534	Bolt (23, 10 mm)
903	Channel Plate, Control Valve Body and Accumulator Housing Assembly
943	Extension Wiring Harness
955	Nut, Channel Plate to Case (2, 10 mm)
956	Plate, Oil Transfer
958	Bolt, Channel Plate to Case (2, 10 mm)

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

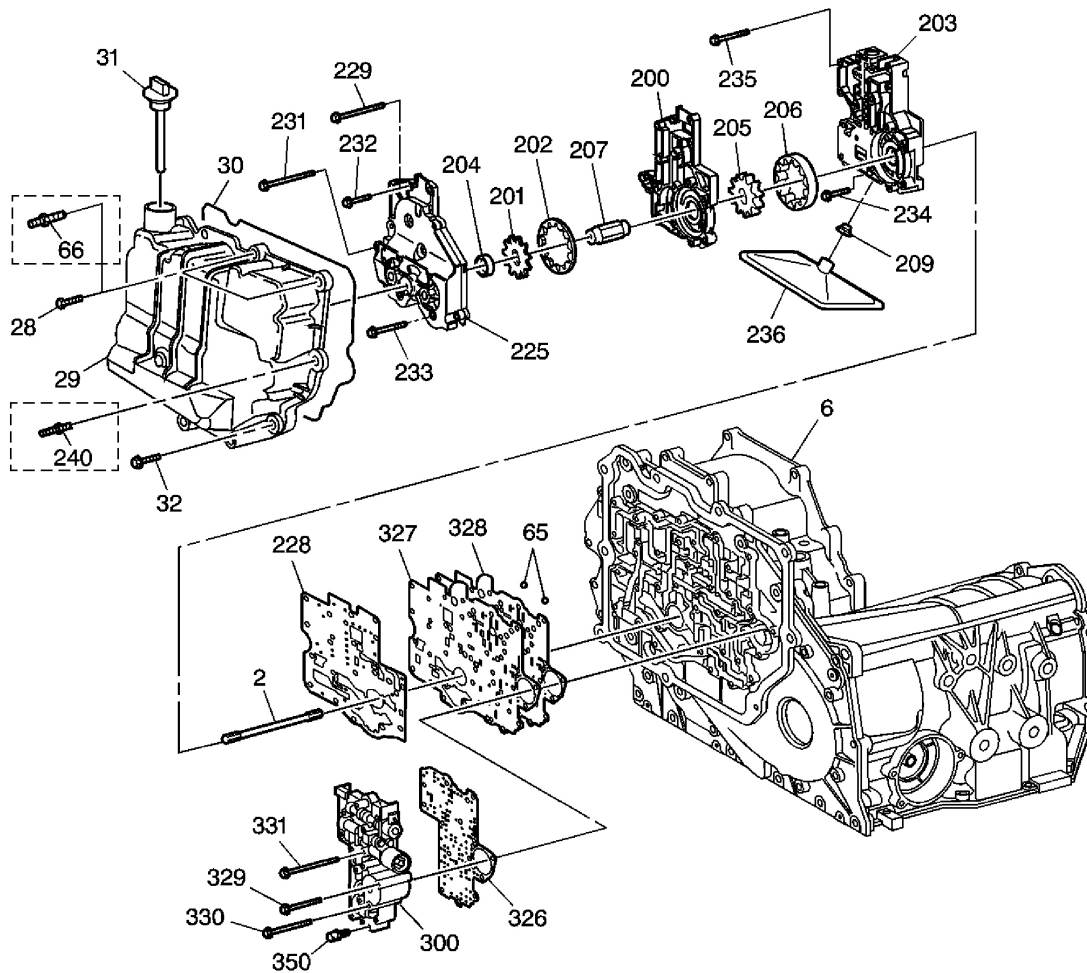


Fig. 2: Case and Associated Parts (2 of 3) Disassembled View
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 2

Callout	Component Name
2	Oil Pump Driven Shaft
6	Transmission Case
28	Side Cover To Case Cover Bolt (8, 15 mm)
29	Side Cover
30	Side Cover To Case Cover Gasket
31	Fluid Level Indicator
32	Side Cover To Case Cover Bolt (1, 13 mm)
65	Checkball (10)
66	Side Cover To Case Cover Stud - Model Dependent

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

200	Primary Pump Body
201	Primary Pump Drive Gear
202	Primary Pump Driven Gear
203	Secondary Pump Body
204	Scavenge Pump Bushing
205	Secondary Pump Drive Gear
206	Secondary Pump Driven Gear
207	Oil Pump Driven Shaft
209	Filter Seal
225	Scavenge Pump Body Assembly
228	Secondary Pump Body To Spacer Plate Gasket
229	Bolt (4, 8 mm)
231	Pump Assembly To Case Bolt (2, 8 mm)
232	Pump Assembly To Case Cover Bolt (5, 8 mm)
233	Pump Assembly To Case Cover Bolt (5, 8 mm)
234	Secondary Pump To Case Cover Bolt (1, 8 mm)
235	Secondary Pump To Case Bolt
236	Transmission Oil Filter
240	Stud, Auxiliary Control Valve Body Cover - Model Dependent
300	Upper Control Valve Body Assembly
326	Valve Body To Spacer Plate Gasket
327	Case Cover Assembly Spacer Plate
328	Spacer Plate To Case Cover Gasket
329	Upper Valve Body To Case Cover Bolt (9, 8 mm)
330	Upper Valve Body To Case Cover Bolt (2, 8 mm)
331	Bolt (6, 8 mm)
350	Temperature Sensor (1, 17 mm)

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

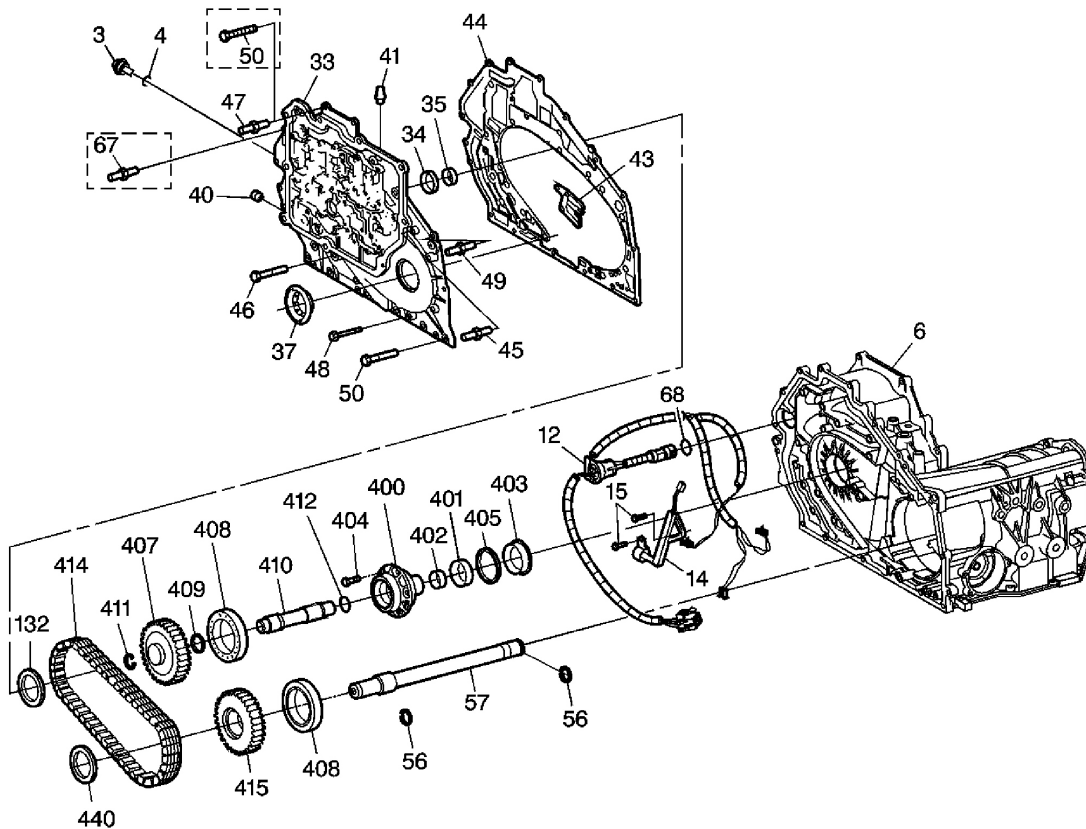


Fig. 3: Case and Associated Parts (3 Of 3)
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 3

Callout	Component Name
3	Quick Disconnect Cooler Connector (1, 19 mm)
4	Quick Disconnect Cooler Connector O-Ring
6	Transmission Case
12	Wiring Harness Assembly
14	Input Speed Sensor Assembly
15	Bolt (4, 8 mm)
33	Transmission Case Cover
34	Case Cover to Drive Sprocket Seal
35	Case Cover to Turbine Shaft Seal
37	Case Cover Axle Seal
40	Case Cover Oil Test Plug - #40 TORX(R)
41	Transmission Vent Adapter

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

43	Sprocket Support to Case Cover Gasket
44	Case to Case Cover Gasket
45	Case Cover to Case Stud (1, 13 mm)
46	Case Cover to Case Bolt (8, 10 mm)
47	Case Cover to Case Stud (2, 13 mm)
48	Case Cover to Driven Sprocket Support Bolt (3, 10 mm)
49	Case Cover to Case Stud (1, 10 mm)
50	Case Cover to Case Bolt (11, 13 mm)
50	Case Cover to Case Bolt (11, 13 mm)
56	Output Shaft Snap Ring (3)
56	Output Shaft Snap Ring (3)
57	Output Shaft
67	Case Cover to Case Stud (1, 13 mm) - Model Dependent
68	Wiring Harness Assembly O-ring
132	Thrust Bearing
400	Drive Sprocket Support
401	Converter Hub Bushing
402	Front Stator Shaft Bushing
403	Converter Hub Assembly Seal Assembly
404	Drive Sprocket Support to Case Bolt (6, 8 mm)
405	Drive Sprocket Support to Case Seal
407	Drive Sprocket
408	Ball Bearing (2)
408	Ball Bearing (2)
409	Drive Sprocket Oil Seal Ring
410	Turbine Shaft
411	Snap Ring
412	O-Ring Seal
414	Drive Link Assembly
415	Driven Sprocket
440	Bearing, Thrust

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

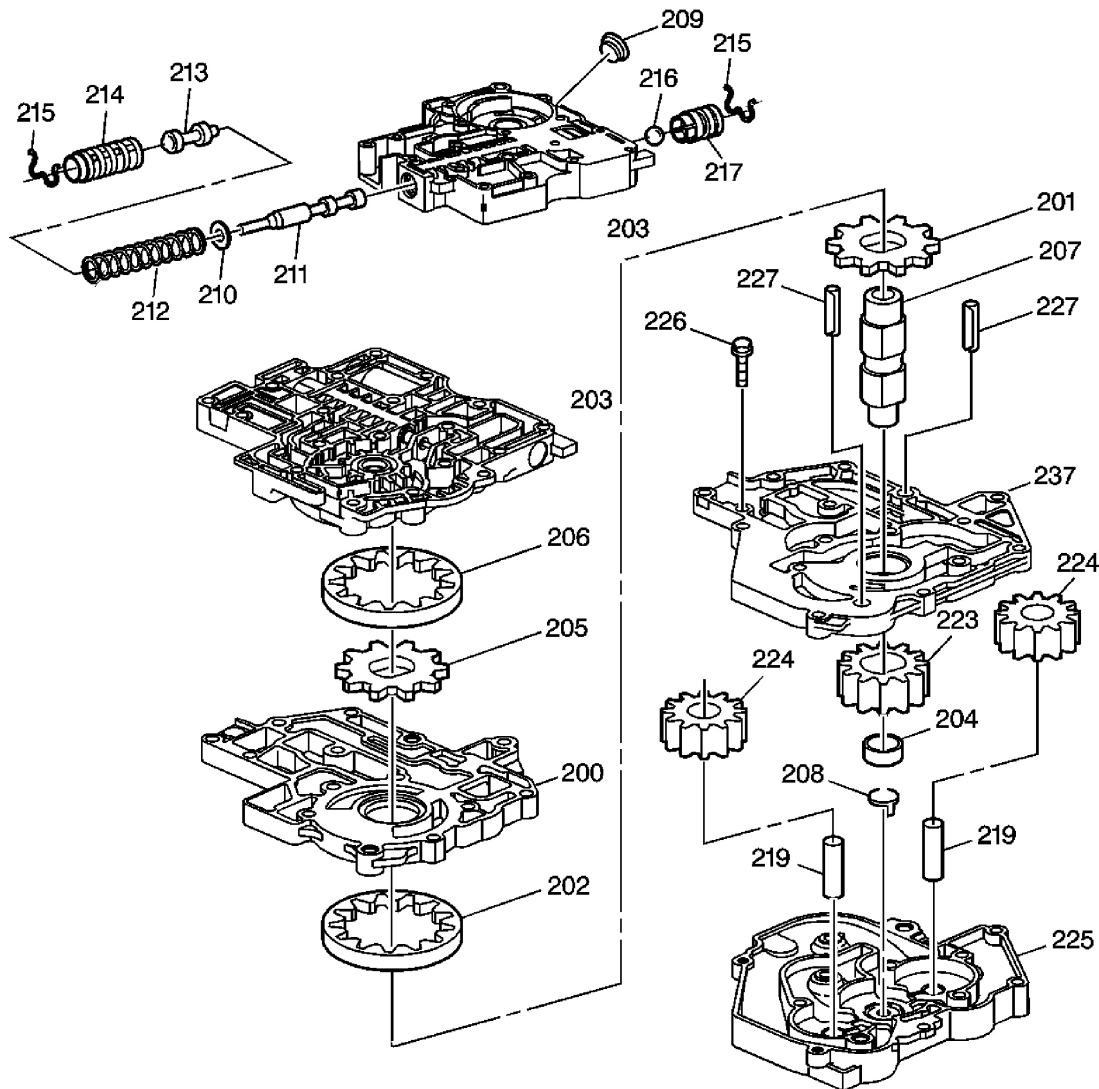


Fig. 4: Scavenge, Primary and Secondary Fluid Pump Assemblies Disassembled View
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 4

Callout	Component Name
200	Primary Pump Body
201	Primary Pump Drive Gear
202	Primary Pump Driven Gear
203	Secondary Pump Body
203	Secondary Pump Body
204	Scavenge Pump Bushing

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

205	Secondary Pump Drive Gear
206	Secondary Pump Driven Gear
207	Oil Pump Driven Shaft Assembly
208	Oil Pump Driven Shaft Thrust Washer
209	Filter Seal
210	Pressure Regulator Spring Retainer
211	Pressure Regulator Valve
212	Pressure Regulator Valve Spring
213	Pressure Regulator Boost Valve
214	Pressure Regulator Boost Valve Sleeve
215	Retainer Clip (2)
215	Retainer Clip (2)
216	Secondary Pump Cut-Off Ball
217	Pump Ball Seat
219	Scavenge Driven Gear Pin
219	Scavenge Driven Gear Pin
223	Scavenge Pump Drive Gear
224	Scavenge Pump Driven Gear (2)
224	Scavenge Pump Driven Gear (2)
225	Scavenge Pump Body
226	Pump Cover to Scavenge Cover Bolt (2)
227	Dowel Bushings (2)
227	Dowel Bushings (2)
237	Scavenge Pump Cover

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

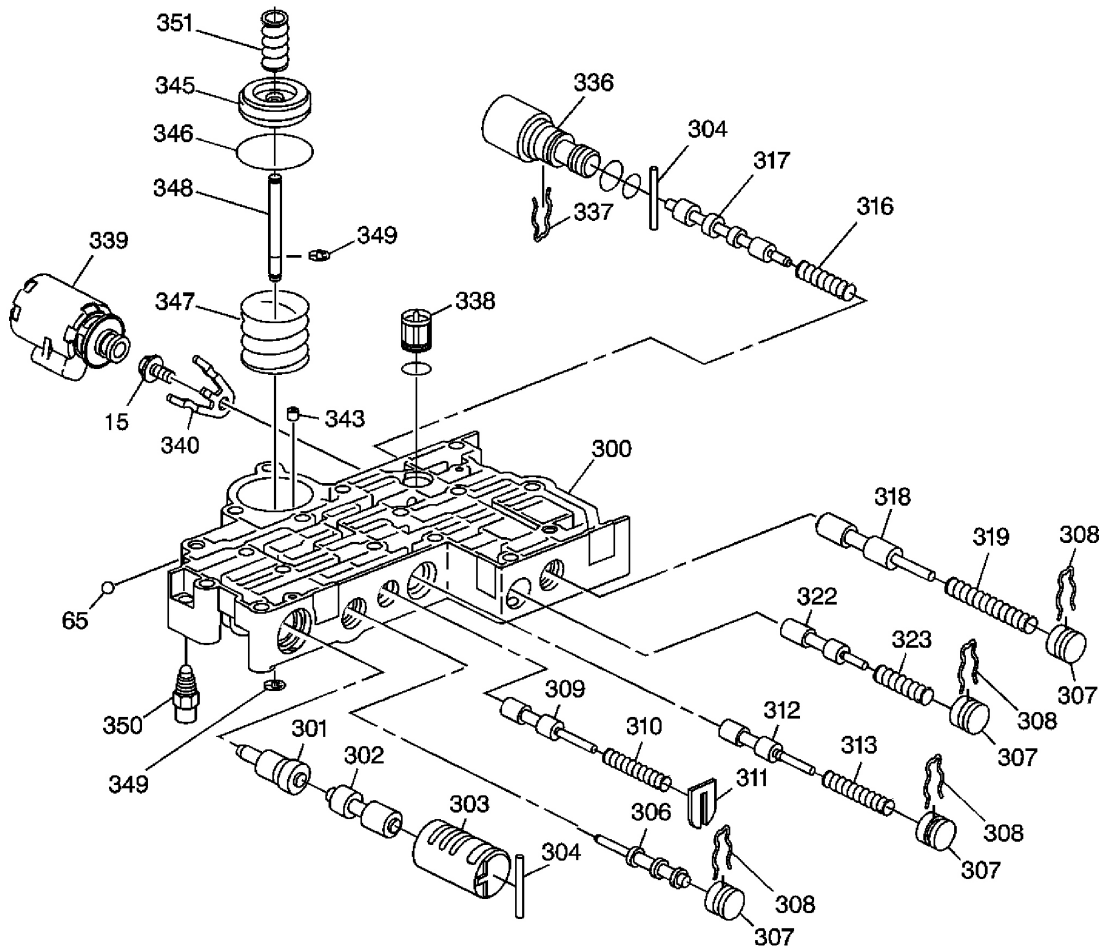


Fig. 5: Upper Control Valve Body Assembly
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 5

Callout	Component Name
15	PC Solenoid Clamp Bolt
65	Oil Hole Plug Ball
300	Upper Control Valve Body
301	Accumulator Boost Valve
302	1-2/3-4 Accumulator Valve
303	1-2/3-4 Accumulator Valve Bushing
304	Coiled Spring Pin (2)
304	Coiled Spring Pin (2)
306	2-3 Accumulator Valve

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

307	Bore Plug (4)
307	Bore Plug (4)
307	Bore Plug (4)
307	Bore Plug (4)
308	Retainer Clip (4)
308	Retainer Clip (4)
308	Retainer Clip (4)
308	Retainer Clip (4)
309	Actuator Feed Limit Valve
310	Actuator Feed Limit Spring
311	Spring Retainer Plate
312	Converter Feed Limit Valve
313	Converter Feed Limit Spring
316	Converter Clutch Control Spring
317	Converter Clutch Control Valve
318	Converter Regulator Valve
319	Converter Clutch Regulator Spring
322	TCC Enable Valve
323	TCC Enable Valve Spring
336	TCC Pressure Solenoid
337	Spring Retainer Clip
338	Pressure Control Solenoid Filter and Seal
339	Pressure Control Solenoid (PCS)
340	PC Solenoid Clamp (PCS Clamp)
343	Orificed Cup Plug
345	2-3 Accumulator Piston
346	2-3 Accumulator Piston Seal
347	2-3 Accumulator Piston Spring
348	2-3 Accumulator Pin
349	Snap Ring
349	Snap Ring
350	Temperature Sensor
351	2-3 Accumulator Piston Cushion Spring

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

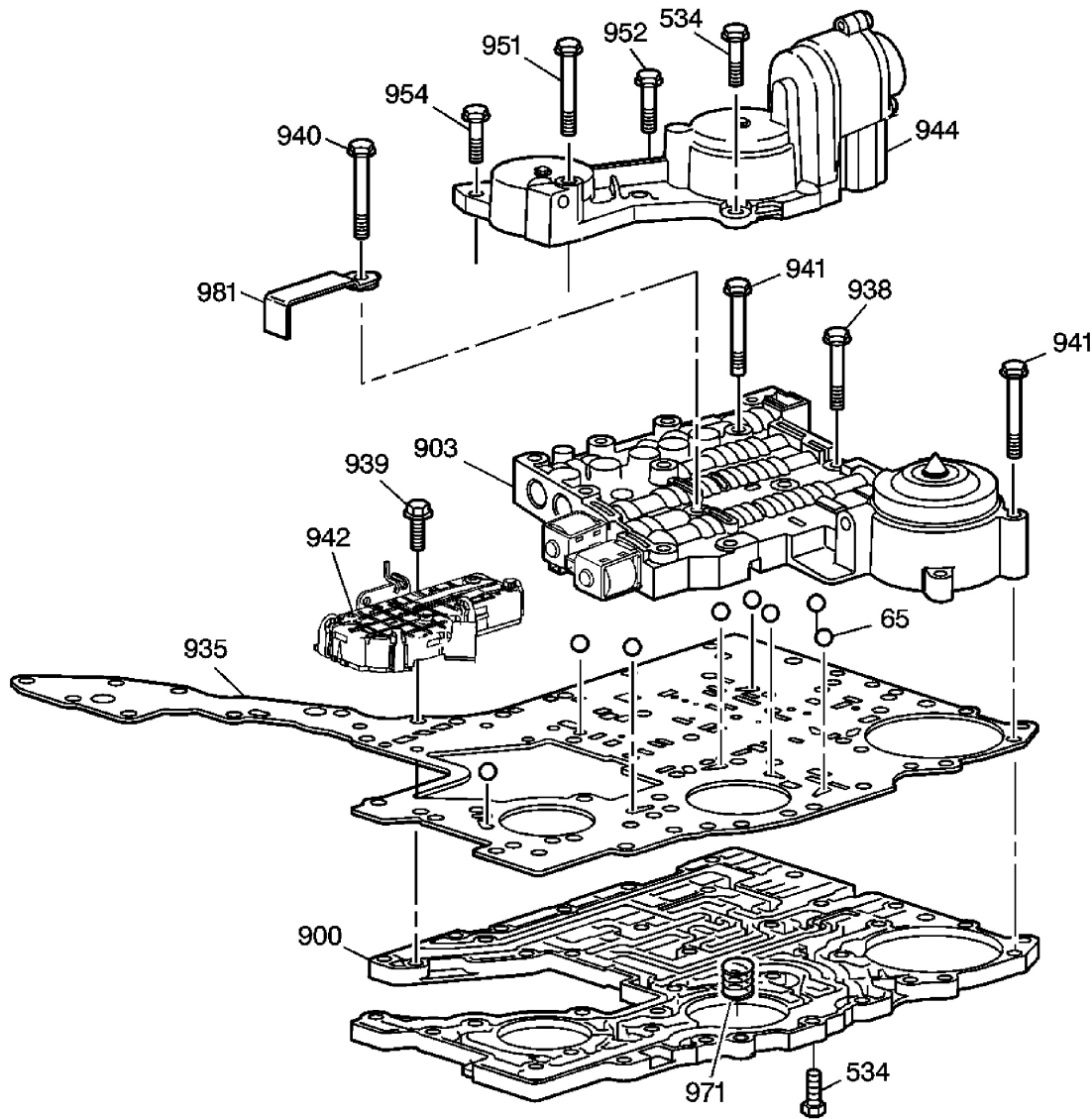


Fig. 6: Lower Channel Plate, Control Valve Body and Accumulator Housing Assembly
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 6

Callout	Component Name
65	Checkballs (8)
534	Channel Plate to LCVB Bolt (1, 10 mm) - Channel Plate to Accumulator Housing Bolt (3, 10 mm) - Accumulator Housing to Channel Plate Bolt (1, 10 mm)
534	Channel Plate to LCVB Bolt (1, 10 mm) - Channel Plate to Accumulator Housing Bolt (3, 10 mm) - Accumulator Housing to Channel Plate Bolt

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

	(1, 10 mm)
900	Lower Channel Plate
903	Channel Plate/Control Valve and Housing Assembly
935	Space/Gasket Plate Assembly
938	LCVB to Channel Plate Bolt (5, 10 mm)
939	Spacer Plate Support to Channel Plate Bolt (3, 8 mm)
940	LCVB to Channel Plate Bolt (2, 10 mm)
941	LCVB to Channel Plate Bolt (8, 10 mm)
941	LCVB to Channel Plate Bolt (8, 10 mm)
942	Internal Mode Switch (IMS)
944	Accumulator Housing
951	Accumulator Assembly to Channel Plate Bolt (1, 10 mm)
952	Accumulator Assembly to Channel Plate Bolt (3, 10 mm)
954	Accumulator Assembly to Channel Plate Bolt (1, 10 mm)
971	1-2 Accumulator Inner Spring Assembly
981	Pressure Control Solenoid Valve Fluid Filter Retainer

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

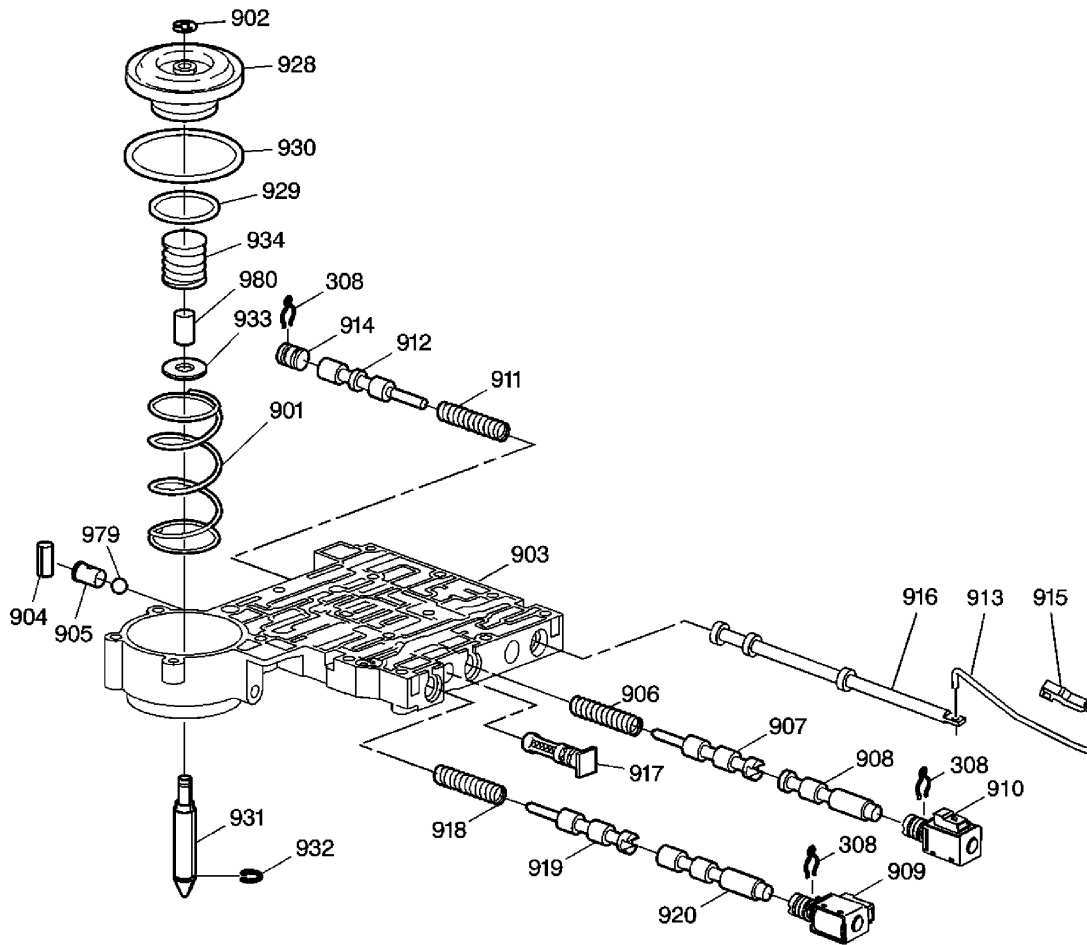


Fig. 7: Lower Control Valve Body Assembly
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 7

Callout	Component Name
308	Retainer Clip (3)
308	Retainer Clip (3)
308	Retainer Clip (3)
901	Return Spring
902	Retaining Ring
903	Lower Control Valve Body
904	Spring Retainer
905	Ball Check Capsule
906	2-3 Shift Valve Spring

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

907	2-3 Shift Valve C
908	2-3 Shift Valve D
909	1-2 Shift Solenoid Valve
910	2-3 Shift Solenoid Valve
911	3-4 Shift Valve Spring
912	3-4 Shift Valve
913	Manual Valve Link
914	Bore Plug
915	Manual Valve Link Retainer
916	Manual Valve
917	Solenoid Screen Assembly
918	1-2 Shift Valve Spring
919	1-2 Shift Valve A
920	1-2 Shift Valve B
928	Low/Reverse Servo Piston
929	Low/Reverse Servo Seal (Small)
930	Low/Reverse Servo Seal (Large)
931	Low/Reverse Servo Apply Pin
932	Retaining Ring
933	Servo Cushion Spring Washer
934	Servo Cushion Spring
979	Ball (0.375 Diameter)
980	Low/Reverse Cushion Sleeve

2006 Buick Lucerne CXS
2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

2006 Buick Lucerne CXS
2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

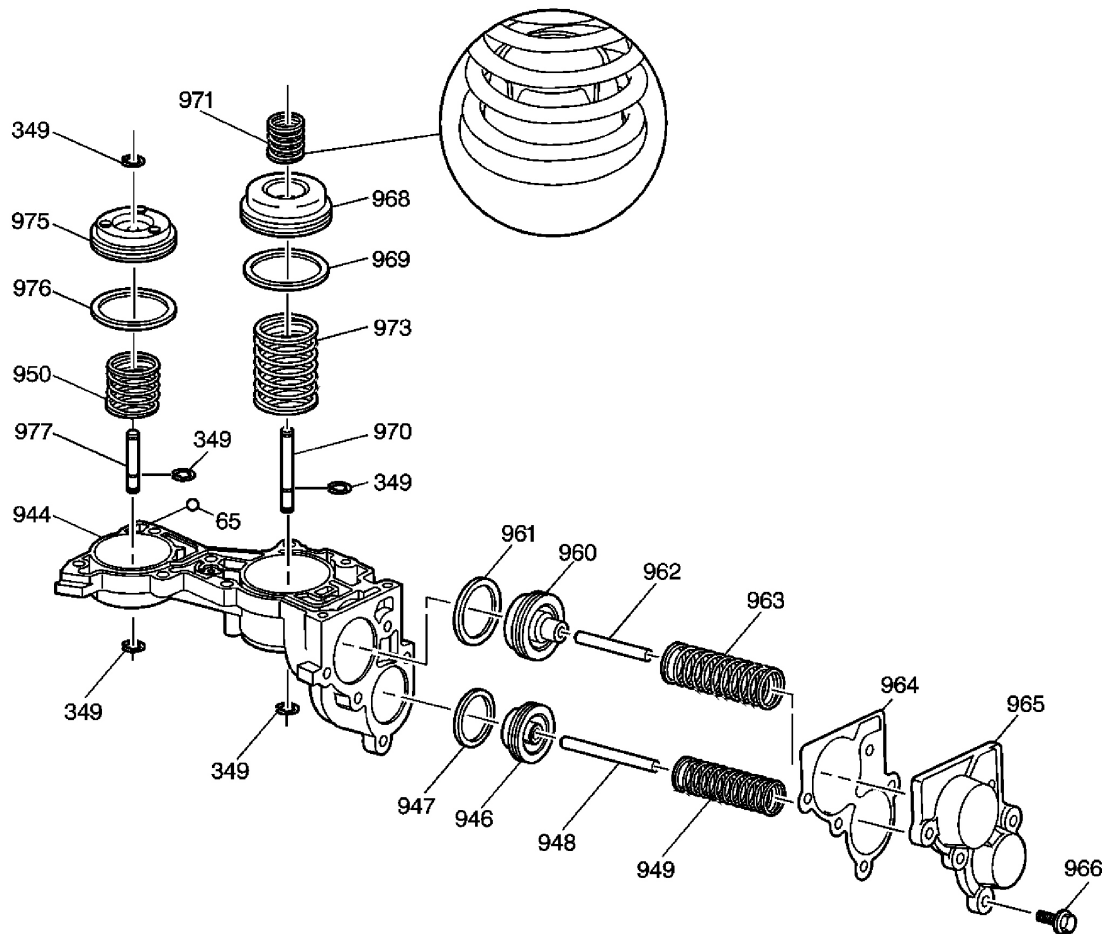


Fig. 8: Accumulator Assembly Disassembled View
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 8

Callout	Component Name
65	Oil Hole Ball Plug (Staked in Casting)
349	Snap Ring (5)
349	Snap Ring (5)
349	Snap Ring (5)
349	Snap Ring (5)
349	Snap Ring (5)
944	Accumulator Housing
946	Reverse Accumulator Piston
947	Reverse Accumulator Piston Seal

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

948	Reverse Accumulator Pin
949	Reverse Accumulator Spring
950	3-4 Accumulator Spring
960	Forward Accumulator Piston
961	Forward Accumulator Seal
962	Forward Accumulator Pin
963	Forward Accumulator Spring
964	Accumulator Housing Cover Gasket
965	Accumulator Housing Cover
966	Accumulator Cover Bolt (5, 8 mm)
968	1-2 Accumulator Piston
969	1-2 Accumulator Piston Seal
970	1-2 Accumulator Pin
971	1-2 Accumulator Inner Spring Assembly
973	1-2 Accumulator Spring
975	3-4 Accumulator Piston
976	3-4 Accumulator Piston Seal
977	3-4 Accumulator Pin

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

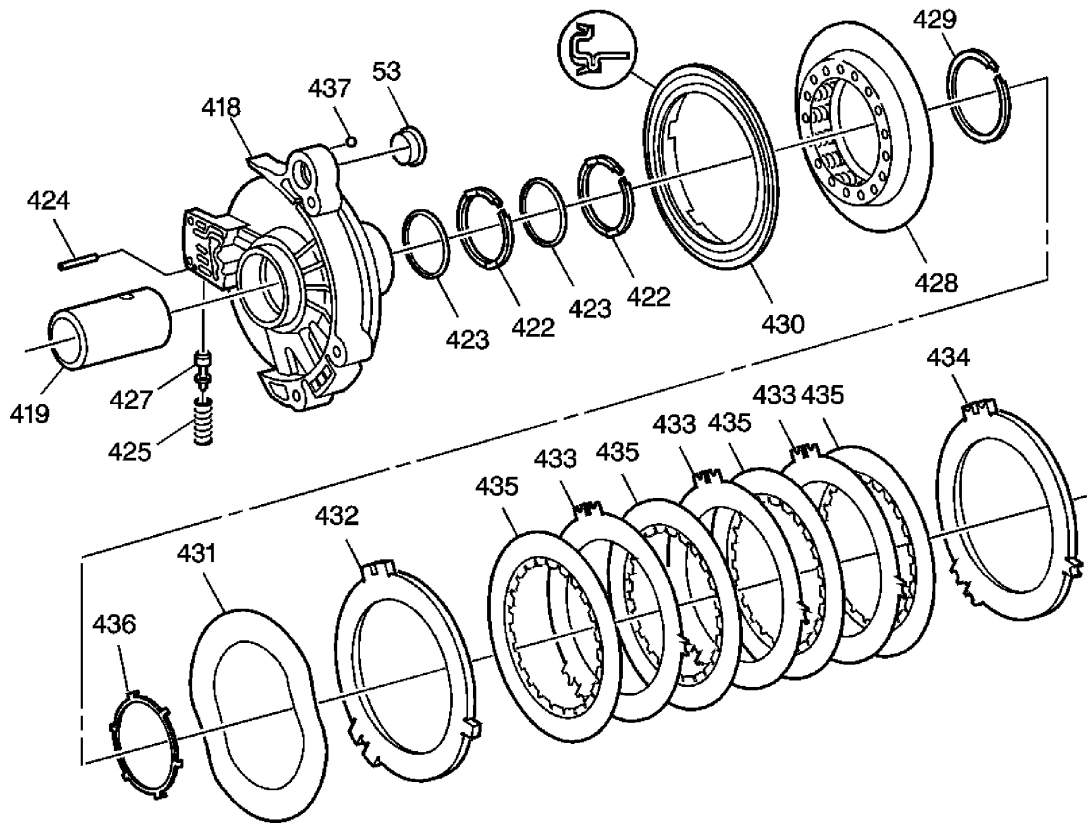


Fig. 9: Driven Sprocket Support and 2nd Clutch Assembly Disassembled View
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 9

Callout	Component Name
53	Scavenger Tube Seal
418	Driven Sprocket Support
419	Oil Transfer Sleeve
422	Oil Ring (2)
422	Oil Ring (2)
423	4 Lobe Seal Ring (2)
423	4 Lobe Seal Ring (2)
424	Spring Pin
425	3rd Clutch Exhaust Valve Spring
427	3rd Clutch Exhaust Valve
428	2nd Clutch Return Spring and Retainer Assembly
429	2nd Clutch/Driven Sprocket Snap Ring

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

430	2nd Clutch Piston Assembly
431	2nd Clutch Waved Plate
432	2nd Clutch Apply Plate
433	2nd Clutch Steel Plate (3)
433	2nd Clutch Steel Plate (3)
433	2nd Clutch Steel Plate (3)
434	2nd Clutch Backing Plate
435	2nd Clutch Fiber Plate (4)
435	2nd Clutch Fiber Plate (4)
435	2nd Clutch Fiber Plate (4)
435	2nd Clutch Fiber Plate (4)
436	Support/Reverse Clutch Thrust Washer
437	0.1875 Diameter Checkball

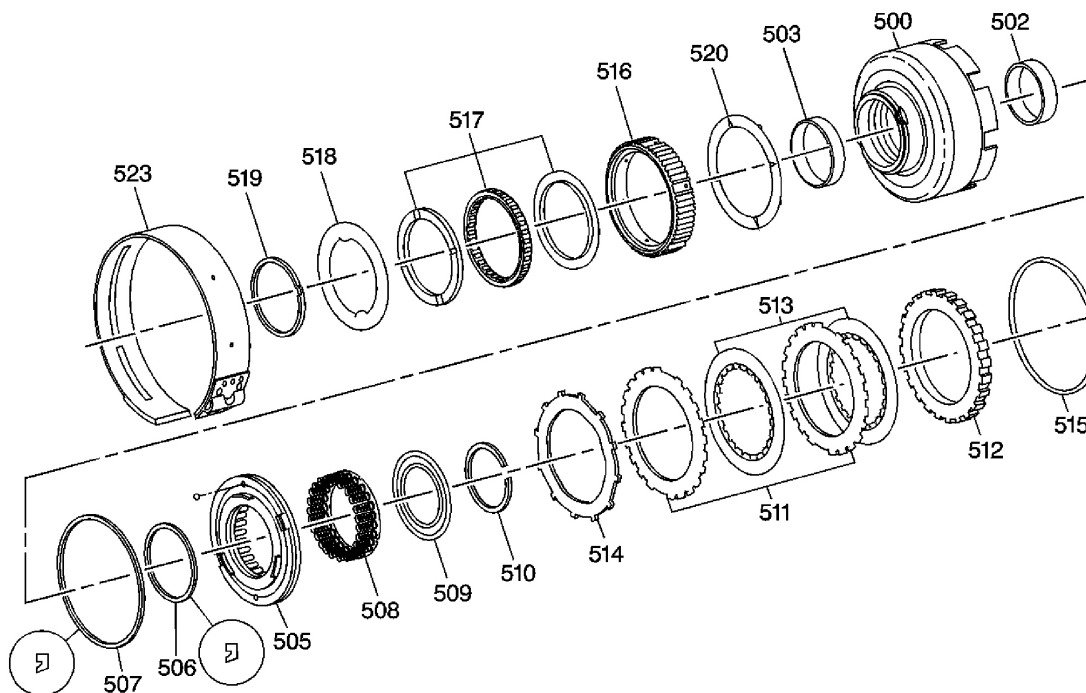


Fig. 10: Reverse Clutch and 2nd Sprag Clutch Assemblies Disassembled View
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 10

Callout	Component Name
500	Reverse Clutch Housing and Race Assembly

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

502	Bushing (Small)
503	Bushing (Large)
505	Reverse Clutch Piston Assembly
506	Seal (Inner)
507	Seal (Outer)
508	Spring and Retainer Assembly
509	Snap Ring Retainer
510	Return Spring Snap Ring
511	Reverse Clutch Plate (Steel) (2)
512	Reverse Clutch Backing Plate (Selective)
513	Reverse Clutch Plate Assembly (Fiber) (2)
514	Waved Plate (Apply)
515	Snap Ring
516	2nd Sprag Race (Outer)
517	2nd Sprag Clutch Assembly
518	2nd Sprag Clutch Retainer
519	Locking Ring
520	2nd Clutch Outer Race Washer
523	4th Band

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

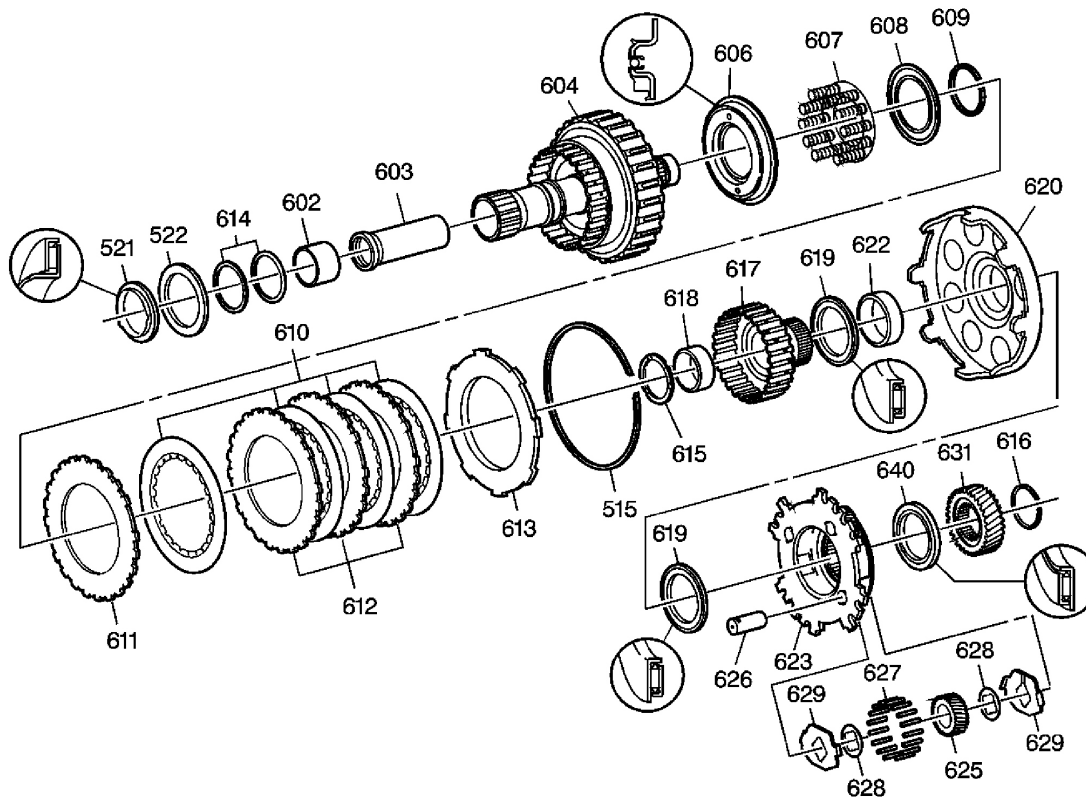


Fig. 11: 3rd Clutch and Reaction Carrier Assembly Disassembled View
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 11

Callout	Component Name
515	Snap Ring
521	Thrust Bearing Assembly
522	Driven Sprocket Support Thrust Washer (Selective)
602	Input Shaft Bushing
603	Input Shaft/Oil Transfer Sleeve
604	3rd Clutch Housing
606	3rd Clutch Piston Assembly
607	Spring and Retainer Assembly
608	Snap Ring Retainer
609	Return Spring Snap Ring
610	3rd Clutch Plate Assembly (Fiber) (4)
611	3rd Clutch Apply Plate (Steel)

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

612	3rd Clutch Plate (Steel) (3)
613	3rd Clutch Backing Plate
614	Oil Seal Ring (2)
615	Input Shaft/3rd Hub Thrust Washer
616	Input Shaft/Input Sun Gear Snap Ring
617	3rd Clutch Hub
618	Hub Bushing
619	Hub/Gear and Shell Thrust Bearing Assembly (2)
619	Hub/Gear and Shell Thrust Bearing Assembly (2)
620	Reaction Sun Gear and Shell Assembly
622	Reaction Sun Gear Bushing
623	Reaction Carrier
625	Planet Pinion (4)
626	Planet Pinion Pin (4)
627	Roller Bearing Needle (68)
628	Steel Pinion Thrust Washer (8)
628	Steel Pinion Thrust Washer (8)
629	Bronze Pinion Thrust Washer (8)
629	Bronze Pinion Thrust Washer (8)
631	Input Sun Gear
640	Input Sun Gear to Reaction Carrier Thrust Bearing

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

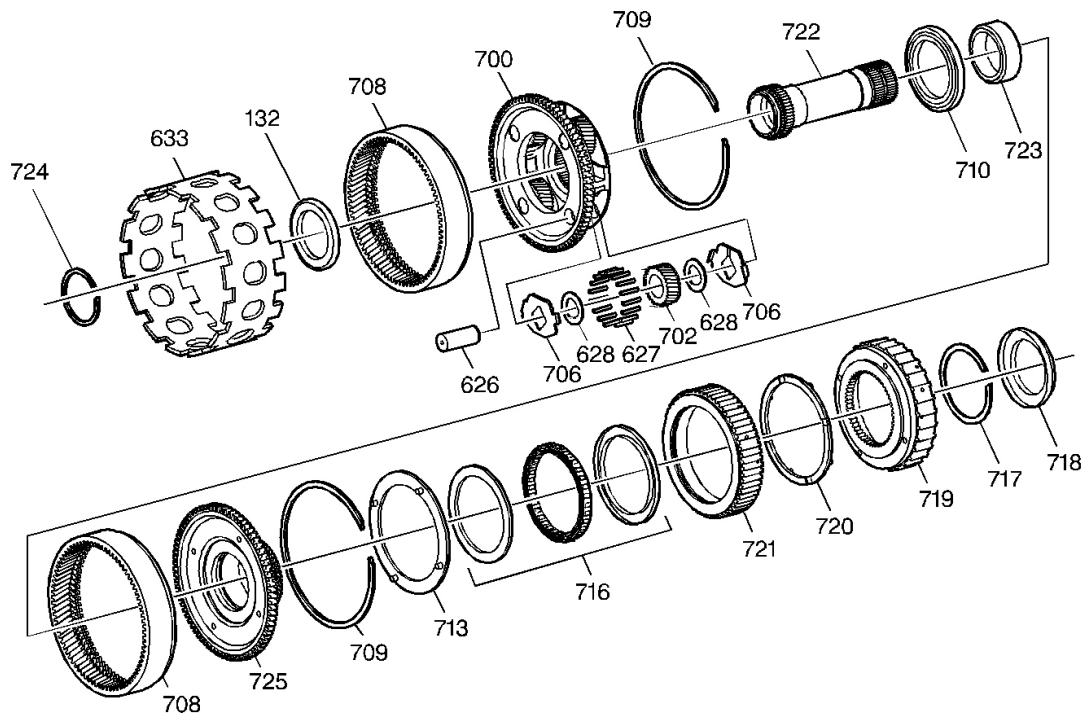


Fig. 12: Input Carrier and Forward Sprag Clutch Assemblies Disassembled View
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 12

Callout	Component Name
132	Thrust Bearing Assembly
626	Planet Pinion Pin (4)
627	Roller Bearing Needle (68)
628	Steel Pinion Thrust Washer (8)
628	Steel Pinion Thrust Washer (8)
633	Reaction Carrier Shell
700	Input Carrier Assembly
702	Planet Pinions (4)
706	Bronze Thrust Washer (8)
706	Bronze Thrust Washer (8)
708	Internal Gear (2)
708	Internal Gear (2)
709	Snap Ring (2)

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

709	Snap Ring (2)
710	Thrust Bearing Assembly
713	Thrust Washer (Flange To Outer Race)
716	Forward Clutch Sprag Assembly
717	Snap Ring (Coast Clutch Hub Retainer)
718	Thrust Bearing (Flange/Forward Clutch Housing)
719	Coast Clutch Hub
720	Thrust Washer (Race/Coast Clutch Hub)
721	Forward Sprag Race (Outer)
722	Final Drive Sun Gear Shaft
723	Input Flange Bushing
724	Snap Ring (Final Drive Shaft/Input Carrier)
725	Input Internal Gear Flange

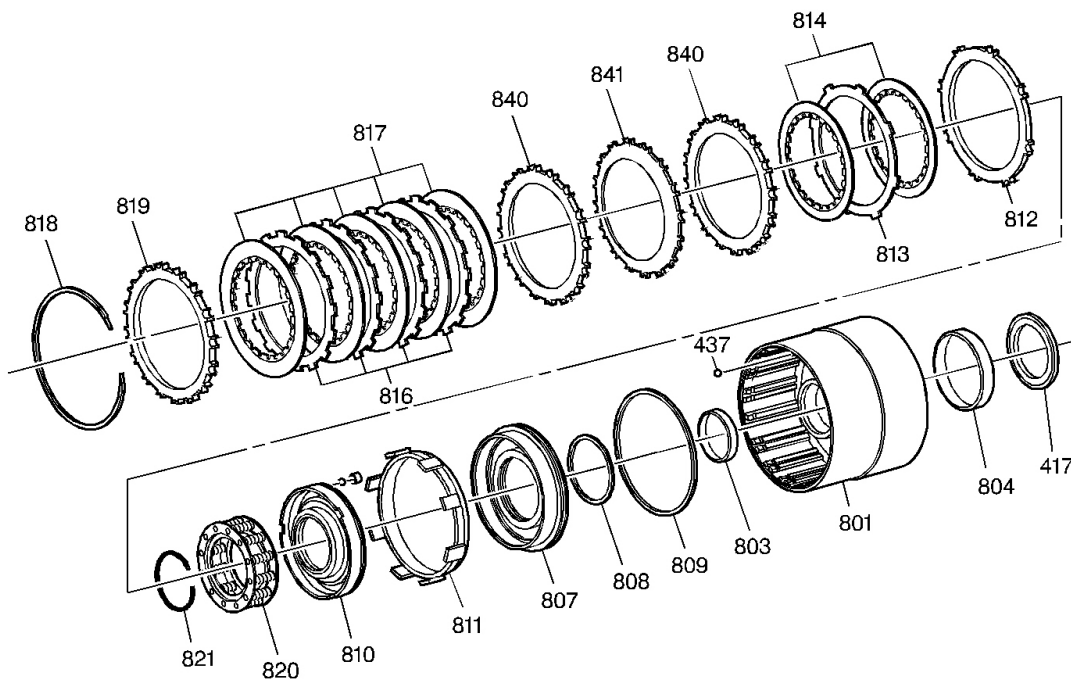


Fig. 13: Forward Clutch Assembly Disassembled View
Courtesy of GENERAL MOTORS CORP.

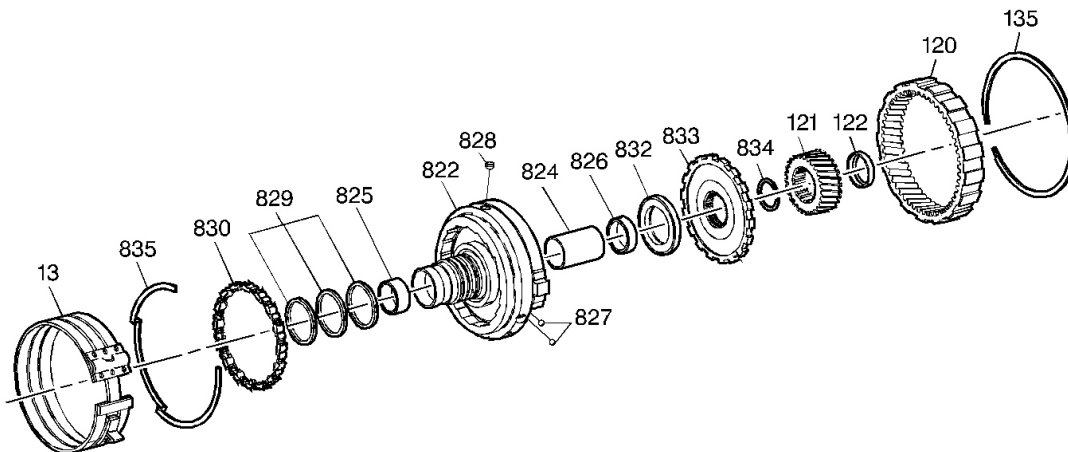
Callouts For Fig. 13

Callout	Component Name

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

417	Thrust Bearing
437	0.1875 Diameter Checkball
801	Forward and Coast Clutch Housing
803	Housing Bushing (Small)
804	Housing Bushing (Large)
807	Forward Clutch Piston
808	Seal (Inner)
809	Seal (Outer)
810	Coast Clutch Piston Assembly
811	Forward Clutch Ring (Apply)
812	Coast Clutch Plate (Apply)
813	Coast Clutch Plate (Steel)
814	Coast Clutch Plate (Fiber) (2)
816	Forward Clutch Plate (Steel) (4)
817	Forward Clutch Plate (Fiber) (5)
818	Snap Ring (Forward Clutch Backing Plate)
819	Forward Clutch Backing Plate
820	Forward Clutch Release Spring Assembly
821	Snap Ring (Forward Return Spring Assembly/Housing)
840	Forward and Coast Clutch Plate (2)
840	Forward and Coast Clutch Plate (2)
841	Forward and Coast Clutch Plate (Belleville)



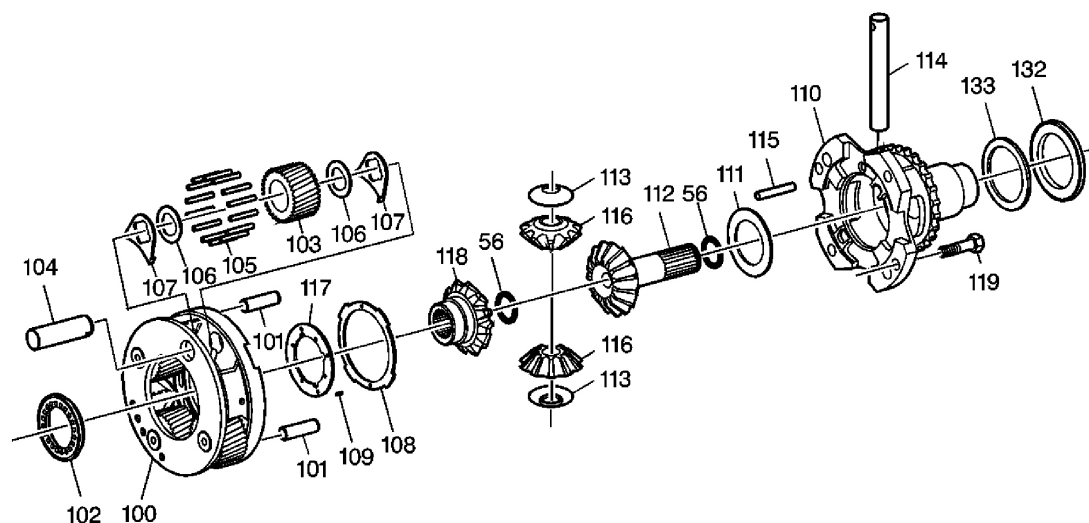
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2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Fig. 14: Forward Clutch Support Assembly Disassembled View
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 14

Callout	Component Name
13	Low/Reverse Band
120	Final Drive Internal Gear
121	Final Drive Sun Gear
122	Final Drive Sun Gear Seal
135	Snap Ring
822	Forward/Coast Clutch Support
824	Oil Transfer Sleeve
825	Left Support/Sun Shaft Bushing
826	Right Support/Sun Shaft Bushing
827	Oil Hole Plug Ball (2)
828	Cooler Return Seal
829	Support/Housing Oil Seal Ring
830	Low Roller Clutch Assembly
832	Forward Clutch Support/Park Gear Thrust Bearing
833	Parking Lock Gear
834	Final Drive Shaft to Park Gear Snap Ring
835	Support/Case Fretting Ring



2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Fig. 15: Final Drive Assembly Disassembled View
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 15

Callout	Component Name
56	Output Shaft Snap Ring
56	Output Shaft Snap Ring
100	Final Drive Carrier
101	Differential Carrier Dowel (2)
101	Differential Carrier Dowel (2)
102	Sun Gear/Carrier Thrust Bearing
103	Final Drive Planet Pinion (4)
104	Final Drive Planet Pinion Pin (4)
105	Roller Needle Bearings (76)
106	Final Drive Pinion Steel Thrust Washers (8)
106	Final Drive Pinion Steel Thrust Washers (8)
107	Final Drive Pinion Bronze Thrust Washers (8)
107	Final Drive Pinion Bronze Thrust Washers (8)
108	Final Drive Carrier Retainer
109	Rolled Pin
110	Differential Carrier
111	Right Differential Thrust Washer
112	Right Differential Side Gear
113	Differential Pinion Thrust Washer (2)
113	Differential Pinion Thrust Washer (2)
114	Differential Pinion Shaft
115	Differential Pinion Shaft Retaining Pin
116	Differential Pinion Gears (2)
116	Differential Pinion Gears (2)
117	Left Differential Thrust Washer
118	Left Differential Side Gear
119	Differential Carrier to Final Drive Carrier Bolt
132	Thrust Bearing Assembly
133	Differential Carrier/Case Extension Selective Thrust Washer

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

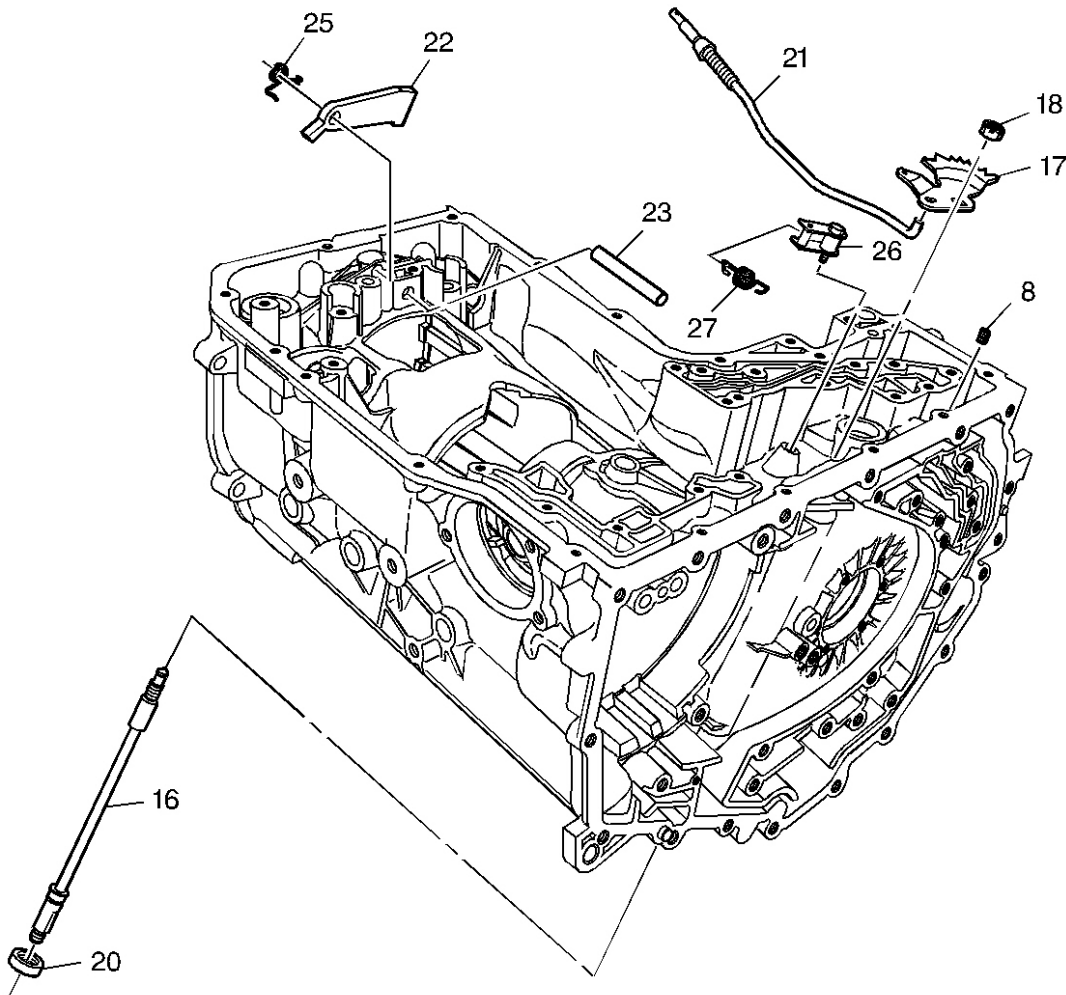


Fig. 16: Parking Pawl, Actuator Assembly and Manual Shaft Disassembled View
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 16

Callout	Component Name
8	Drain Plug
16	Manual Shaft
17	Inside Detent Lever
18	Manual Shaft To Detent Lever Nut
20	Manual Shaft Seal
21	Park Lock Actuator Assembly
22	Parking Lock Pawl

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

23	Parking Pawl Pivot Pin
25	Parking Pawl Return Spring
26	Detent Lever and Roller Assembly
27	Detent Spring

AUTOMATIC TRANSMISSION ELECTRONIC COMPONENT VIEWS

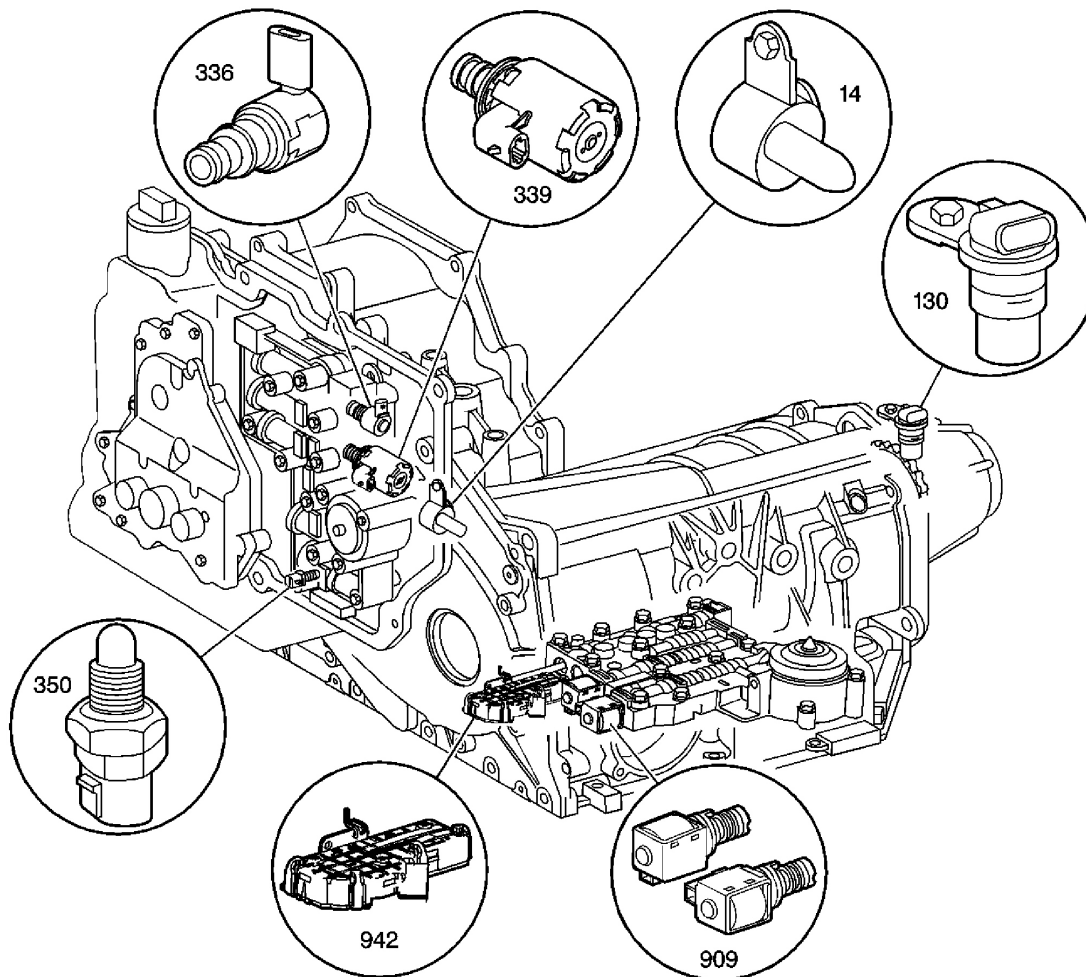


Fig. 17: Electronic Component Views
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 17

Callout	Component Name
14	Automatic Transmission Input (Shaft) Speed Sensor (ISS)
130	Vehicle Speed Sensor (VSS)

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

336	Torque Converter Clutch (TCC) Solenoid Valve
339	Pressure Control Solenoid (PCS) Valve
350	Automatic Transmission Fluid Temperature (TFT) Sensor
909	1-2 and 2-3 Shift Solenoid (1-2 SS) (2-3 SS) Valves
942	Internal Mode Switch (IMS)

COMPONENT LOCATION

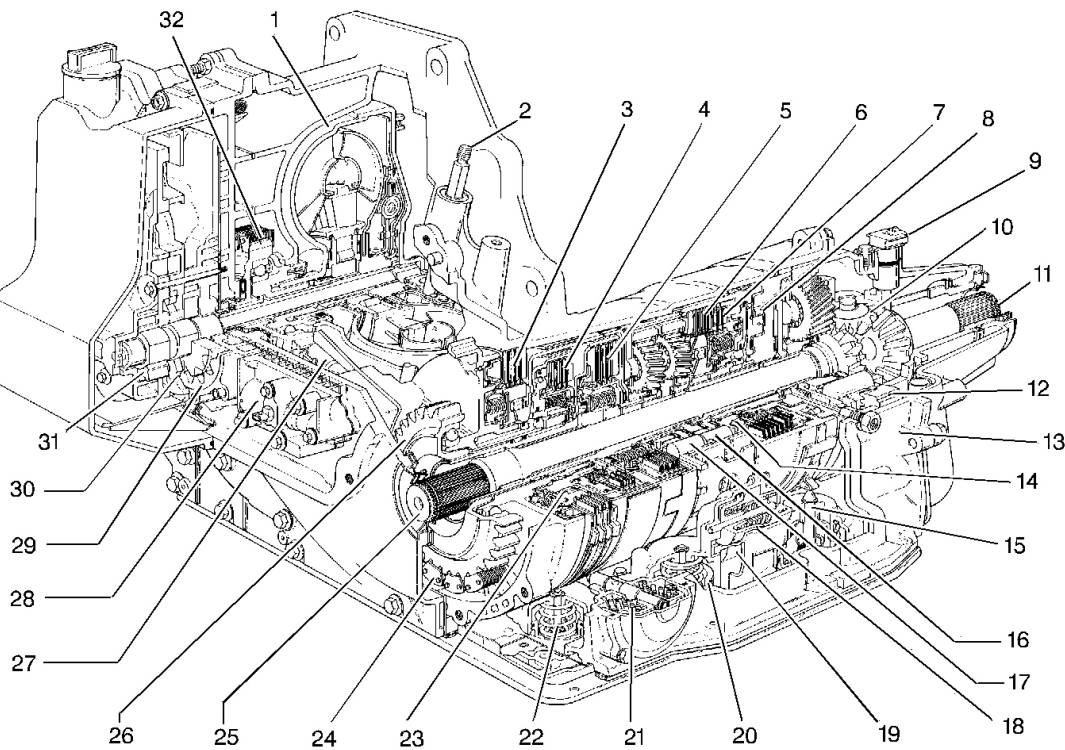


Fig. 18: Transaxle Major Components
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 18

Callout	Component Name
1	Torque Converter Assembly
2	Manual Shaft
3	2nd Clutch
4	Reverse Clutch
5	3rd Clutch

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

6	Forward Clutch
7	Coast Clutch
8	Low Roller Clutch Assembly
9	Output Speed Sensor Assembly
10	Differential Assembly
11	Output Shaft (Differential Side Gear)
12	Final Drive Assembly
13	Lube Fitting
14	Forward Sprag Clutch Assembly
15	Low/Reverse Servo Assembly
16	Input Planetary Gear Set
17	Reaction Planetary Gear Set
18	Reverse Accumulator
19	Forward Accumulator
20	1-2 Accumulator
21	4th Servo
22	3-4 Accumulator
23	2nd Sprag Clutch Assembly
24	Drive Link Assembly
25	Output Shaft
26	Driven Sprocket
27	Input Speed Sensor Assembly
28	Upper Control Valve Body Assembly
29	Secondary Pump Assembly
30	Primary Pump Assembly
31	Scavenge Pump Assembly
32	Drive Sprocket

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

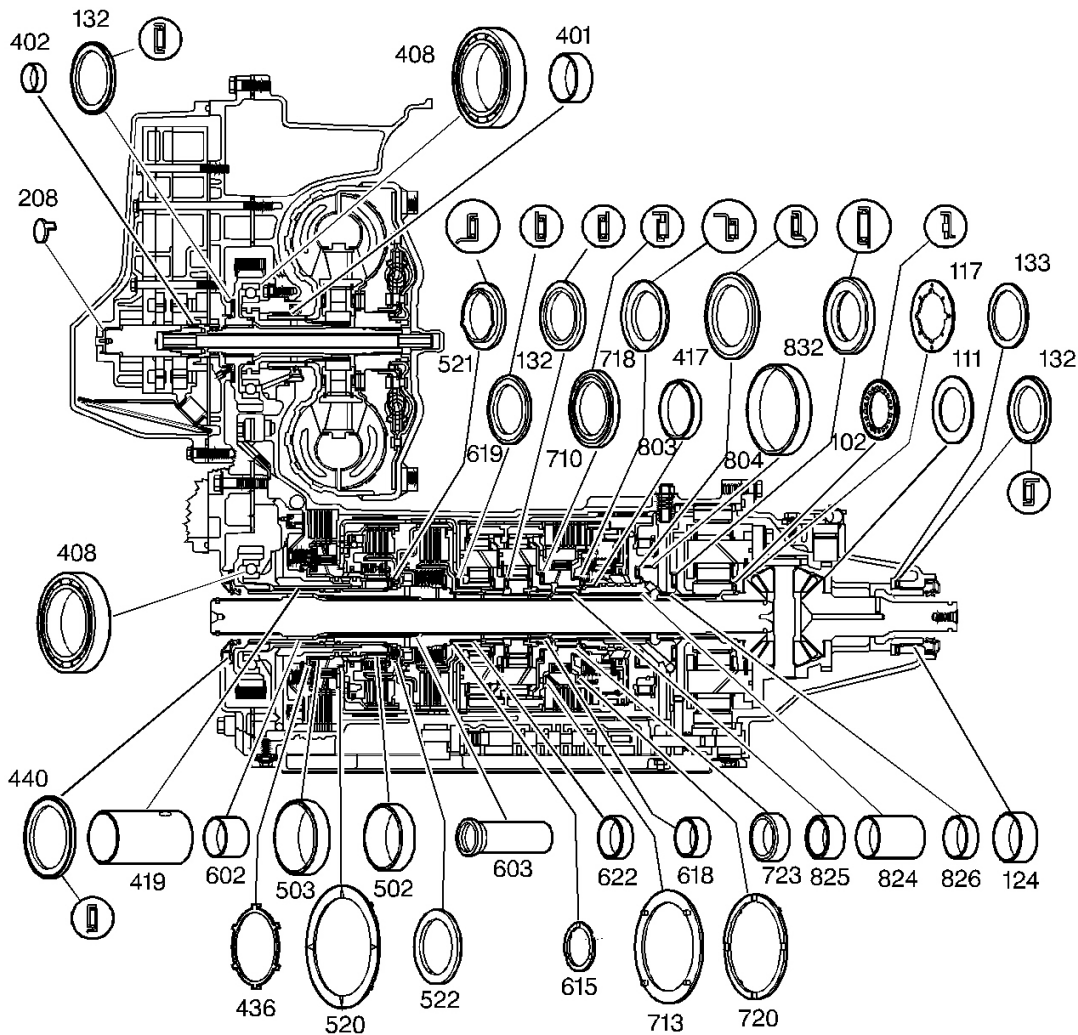


Fig. 19: Transaxle Bushings, Bearings and Washers Components
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 19

Callout	Component Name
102	Final Drive Sun Gear/Final Drive Carrier Thrust Bearing
111	Right Differential Thrust Washer
117	Left Differential Thrust Washer
124	Case Extension Bushing
132	Thrust Bearing Assembly
132	Thrust Bearing Assembly

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

132	Thrust Bearing Assembly
133	Differential Carrier/Case Extension Selective Thrust Washer
208	Oil Pump Driven Shaft Thrust Washer
401	Converter Hub Bushing
402	Front Stator Shaft Bushing
408	Ball Bearing (2)
417	Thrust Bearing
419	Oil Transfer Sleeve
436	Support/Reverse Clutch Thrust Washer
440	Thrust Bearing
502	Small Bushing
503	Large Bushing
520	2nd Clutch Outer Race Washer
521	Thrust Bearing
522	Driven Sprocket Support Selective Thrust Washer
602	Input Shaft Bushing
603	Input Shaft/Oil Transfer Sleeve
615	Input Shaft/3rd Hub Thrust Washer
618	Hub Bushing
619	Thrust Bearing Assembly
622	Reaction Sun Gear Bushing
710	Thrust Bearing Assembly
713	Flange to Outer Race Thrust Washer
718	Flange/Forward Clutch Housing Thrust Bearing
720	Race/Coast Clutch Hub Thrust Washer
723	Input Flange Bushing
803	Small Housing Bushing
804	Large Housing Bushing
824	Oil Transfer Sleeve
825	Left Support/Sun Shaft Bushing
826	Right Support/Sun Shaft Bushing
832	Forward Clutch Support/Park Gear Thrust Bearing

2006 Buick Lucerne CXS
2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

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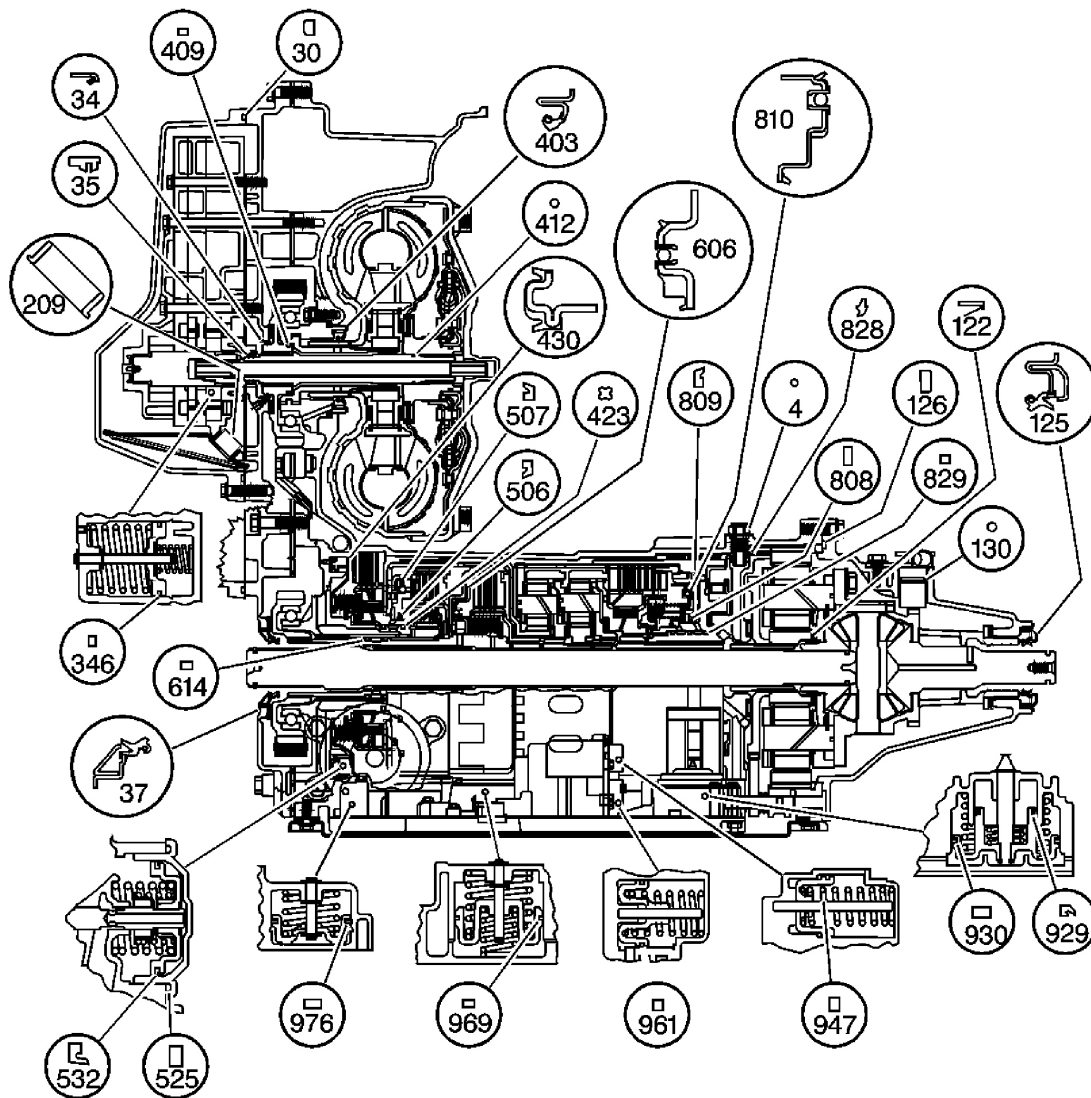


Fig. 20: Locating Transaxle Seals
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 20

Callout	Component Name
4	Connector, O-Ring Cooler (Return)
30	Gasket, Side Cover to Case Cover
34	Seal, Case Cover to Drive Sprocket
35	Seal, Case Cover to Turbine Shaft
37	Seal, Axle Case Cover
122	Seal, Final Drive Sun Gear

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

125	Seal, Axle to Case Extension
126	Seal, Case Extension to Case
130	Sensor, Speed Output Assembly
209	Seal, Filter
346	Seal, 2-3 Accumulator Piston
403	Seal, Converter Hub Assembly
409	Ring, Drive Sprocket Oil Seal
412	Seal, O-Ring
423	Ring, 4 Lobe Seal (2)
430	Piston Assembly, 2nd Clutch
506	Seal (Inner)
507	Seal (Outer)
525	Seal, Servo Cover
532	Seal, 4th Servo Piston
606	Piston Assembly, 3rd Clutch
614	Ring, Oil Seal (2)
808	Forward Clutch Piston Seal (Inner)
809	Forward Clutch Piston Seal (Outer)
810	Piston Assembly, Coast Clutch
828	Seal, Cooler Return
829	Ring, Oil Seal (Support/Housing) (3)
929	Seal, Low/Reverse Servo (Small)
930	Seal, Low/Reverse Servo (Large)
947	Seal, Reverse Accumulator
961	Seal, Forward Accumulator
969	Seal, 1-2 Accumulator
976	Seal, 3-4 Accumulator

REPAIR INSTRUCTIONS

TORQUE CONVERTER AND OIL PUMP DRIVE SHAFT REMOVAL

CAUTION: The torque converter weighs approximately 65 lbs. Personal injury may result if you lift the torque converter improperly.

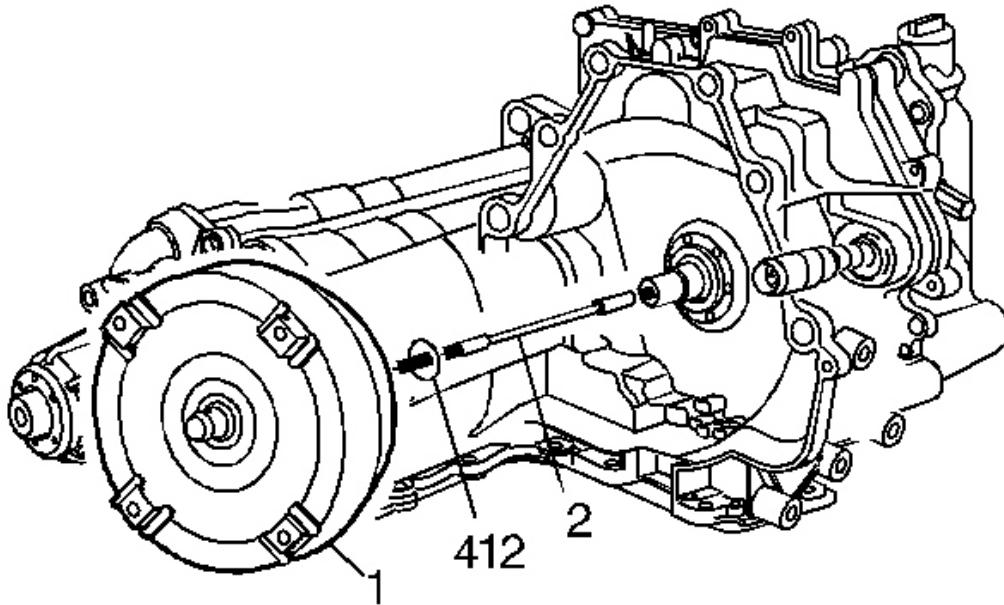


Fig. 21: Oil Pump Driven Shaft & Torque Converter
Courtesy of GENERAL MOTORS CORP.

1. Remove the torque converter (1).
2. Remove the turbine shaft O-ring seal (412).
3. Remove the oil pump driven shaft (2).

HOLDING FIXTURE INSTALLATION

Tools Required

- **J 39050** 4T80-E Holding Fixture. See **Special Tools**.
- **J 3289-20** Transmission Support Fixture Base

CAUTION: To reduce the possibility of personal injury or transmission damage, make sure, when doing the next step, that all of the bolts for the support fixture are installed as shown, and that the bolts are tightened to 11 N.m (98 lb in).

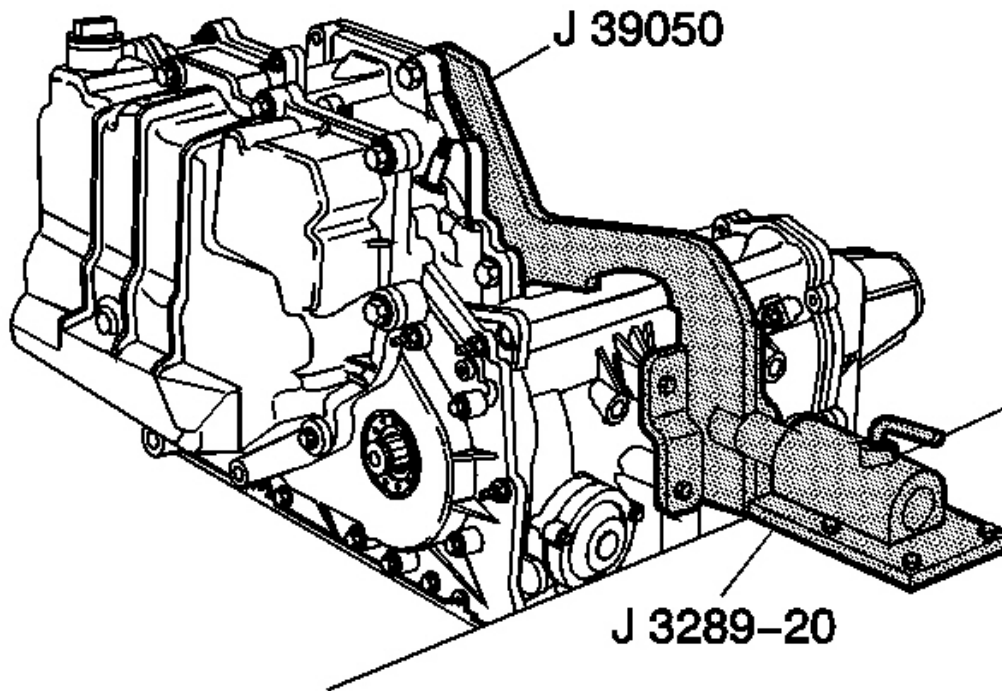


Fig. 22: Installing J 39050 & J 3289-20 On Transmission
Courtesy of GENERAL MOTORS CORP.

1. Install the **J 39050** on the transmission. See Special Tools.
2. Install the **J 39050** and the transmission into the **J 3289-20** . See Special Tools.
3. Position the transmission with the case extension pointing downward in order to allow the fluid to drain.
4. Insert the pin into the **J 3289-20** .

OSS SENSOR AND COOLER FITTING REMOVAL

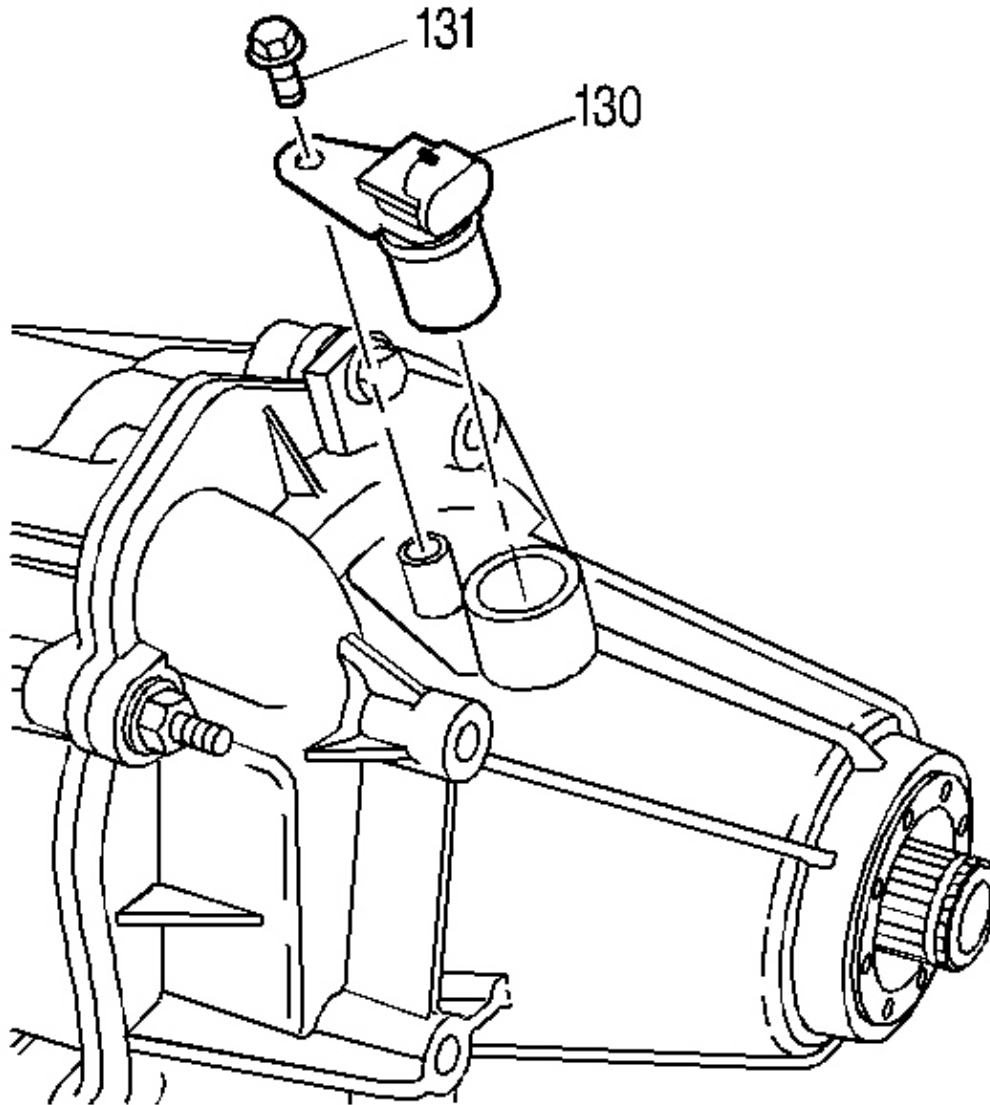


Fig. 23: Identifying Sensor & Retaining Bolt
Courtesy of GENERAL MOTORS CORP.

1. Remove the 10 mm bolt (131) from the output shaft speed sensor.
2. Remove the output shaft speed sensor and seal (130).

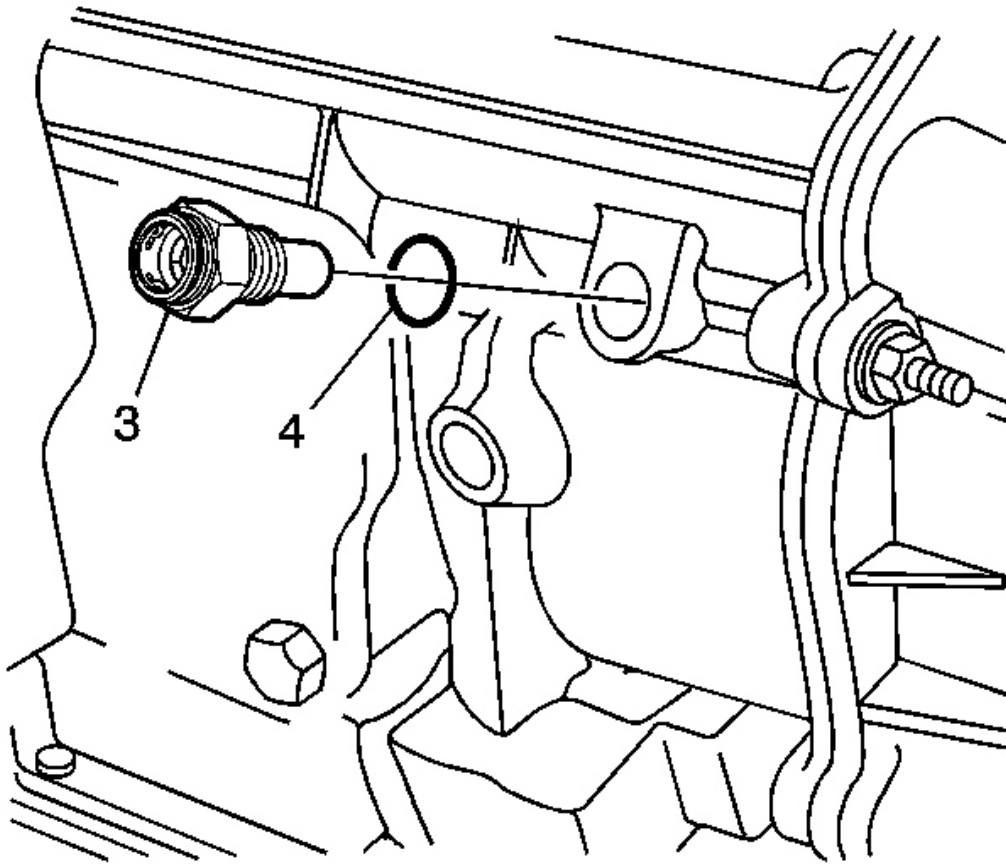


Fig. 24: Cooler Line Fitting & Seal
Courtesy of GENERAL MOTORS CORP.

3. Remove the 19 mm cooler line fitting (3) and seal (4).

FOURTH SERVO REMOVAL

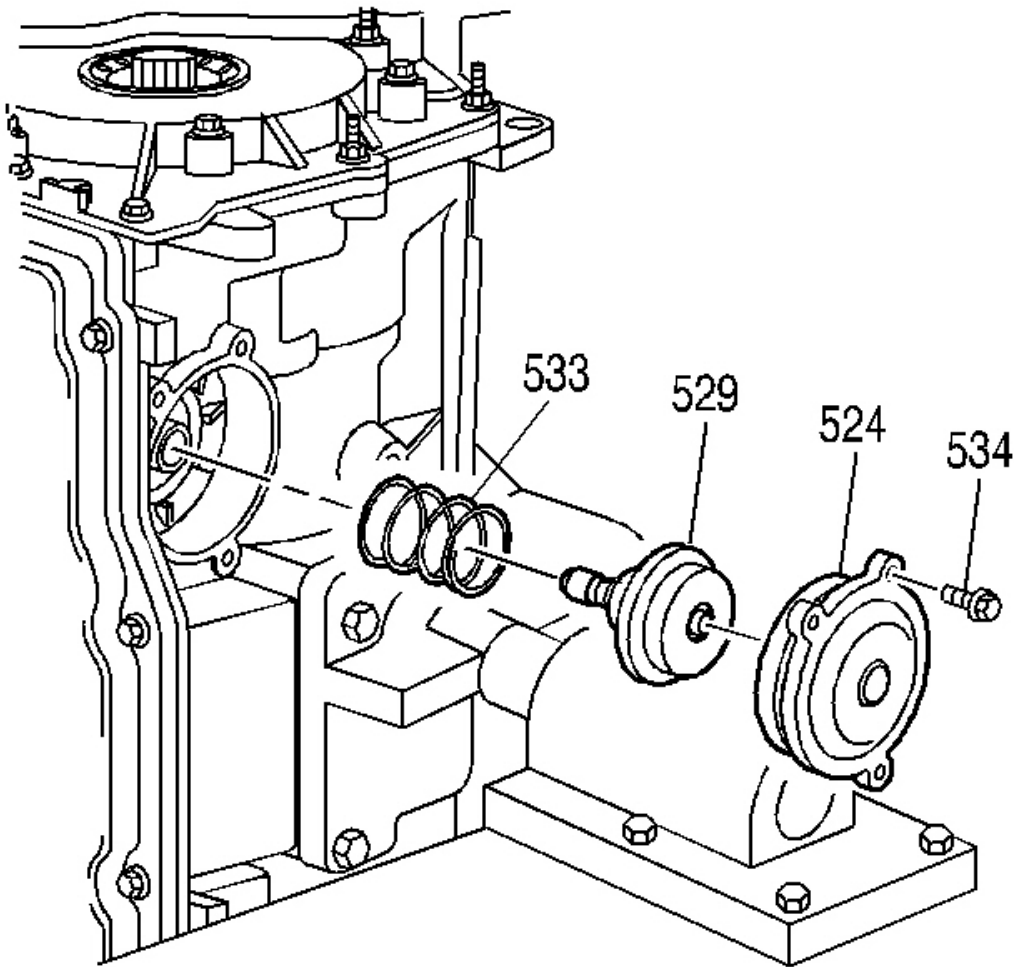


Fig. 25: Identifying 4th Servo Piston Assembly And Cover
Courtesy of GENERAL MOTORS CORP.

NOTE: Hold the servo cover in place until all the bolts are removed evenly or the apply pin will damage the bore.

1. Remove the three 10-mm bolts (534) from the servo cover.
2. Remove the following parts:
 - The servo cover (524)
 - The servo assembly (529)

- The spring (533)

FINAL DRIVE END PLAY MEASUREMENT

Tools Required

- **J 25025-7A** Dial Indicator Post
- **J 28585** Snap Ring Remover
- **J 8001** Dial Indicator

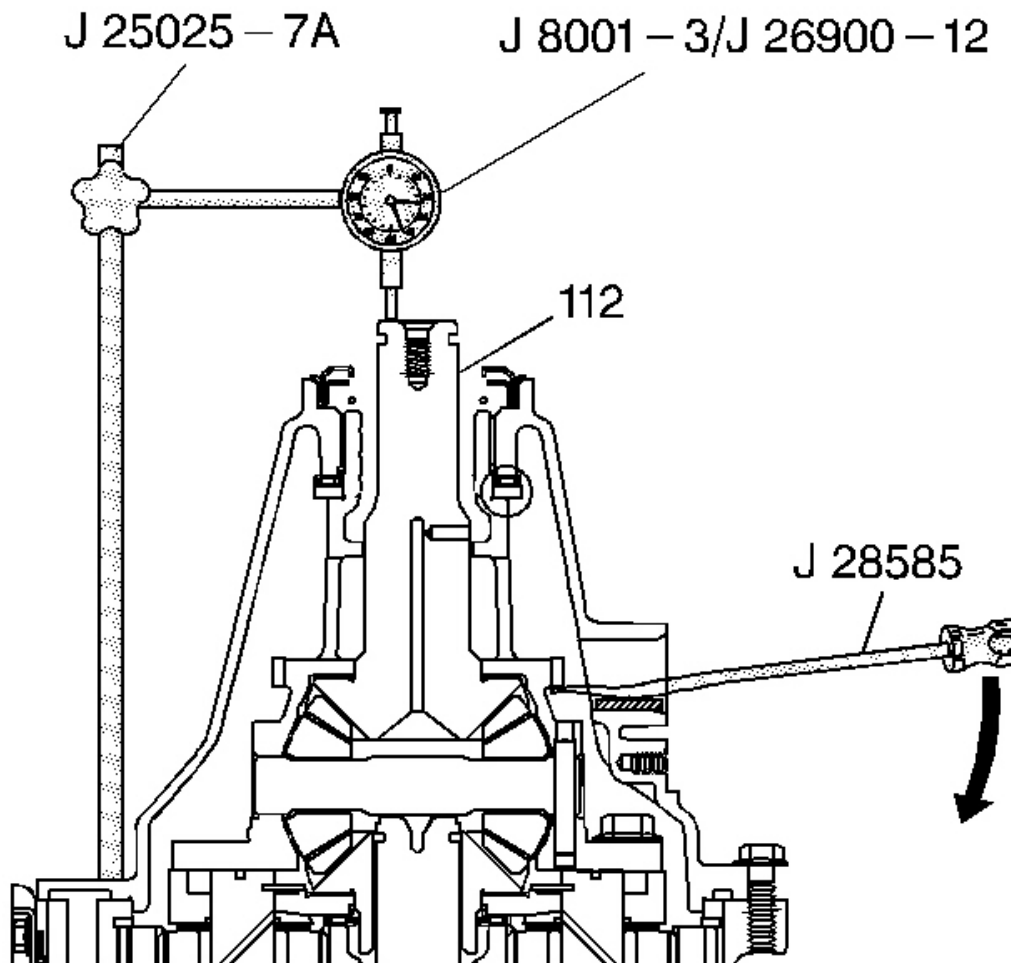


Fig. 26: View Of J 25025-7A & J 8001 Measuring End Play Clearance

2006 Buick Lucerne CXS
2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Courtesy of GENERAL MOTORS CORP.

1. Install the **J 25025-7A** and the **J 8001** .
2. Position the dial indicator with the stem contacting the output shaft (112). Zero the dial indicator.
3. Insert the **J 28585** through the vehicle speed sensor bore and lift the speed sensor rotor for measurement. Protect the bore with a piece of wood or a suitable piece of plastic.
4. Proper end play clearance is 0.15-0.65 mm (0.006-0.026 in).
5. Record the measured specification. If necessary make an adjustment during reassembly using a selective thrust washer with the proper thickness.
6. Remove the dial indicator set and the post.

CASE EXTENSION AND SCAVENGE PIPE REMOVAL

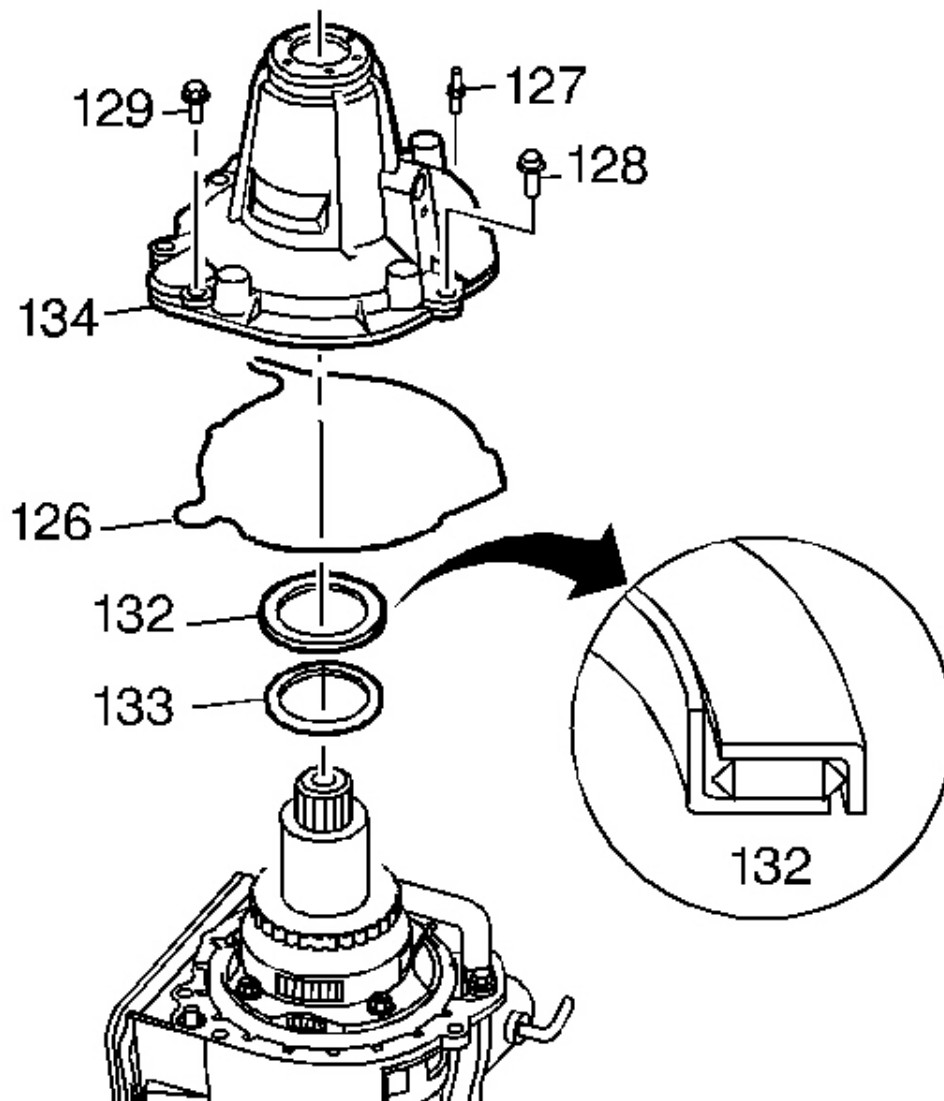


Fig. 27: View Of Case Extension Components
Courtesy of GENERAL MOTORS CORP.

1. Remove the following parts from the case extension:
 - Five 13-mm bolts (128, 129)
 - One 15-mm stud (127)

2. Remove the case extension (134) and the seal (126).
3. Remove the roller thrust bearing (132) and the selective washer (133)

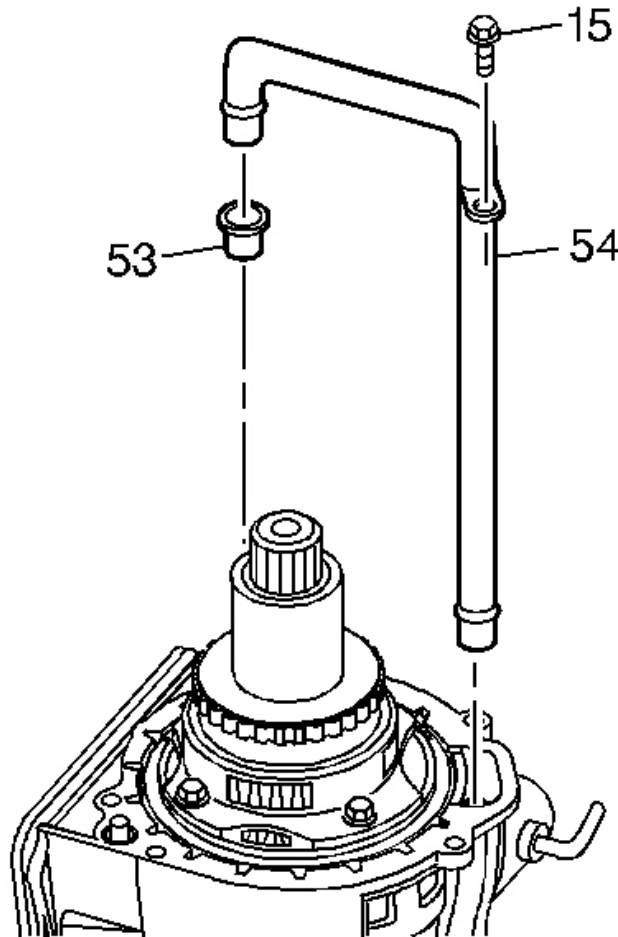


Fig. 28: Identifying Scavenge Tube & Seals
Courtesy of GENERAL MOTORS CORP.

4. Remove the 8-mm scavenge tube bolt (15).
5. Remove the scavenge tube (54) by prying on the differential.
6. Remove the scavenge tube seal (53).

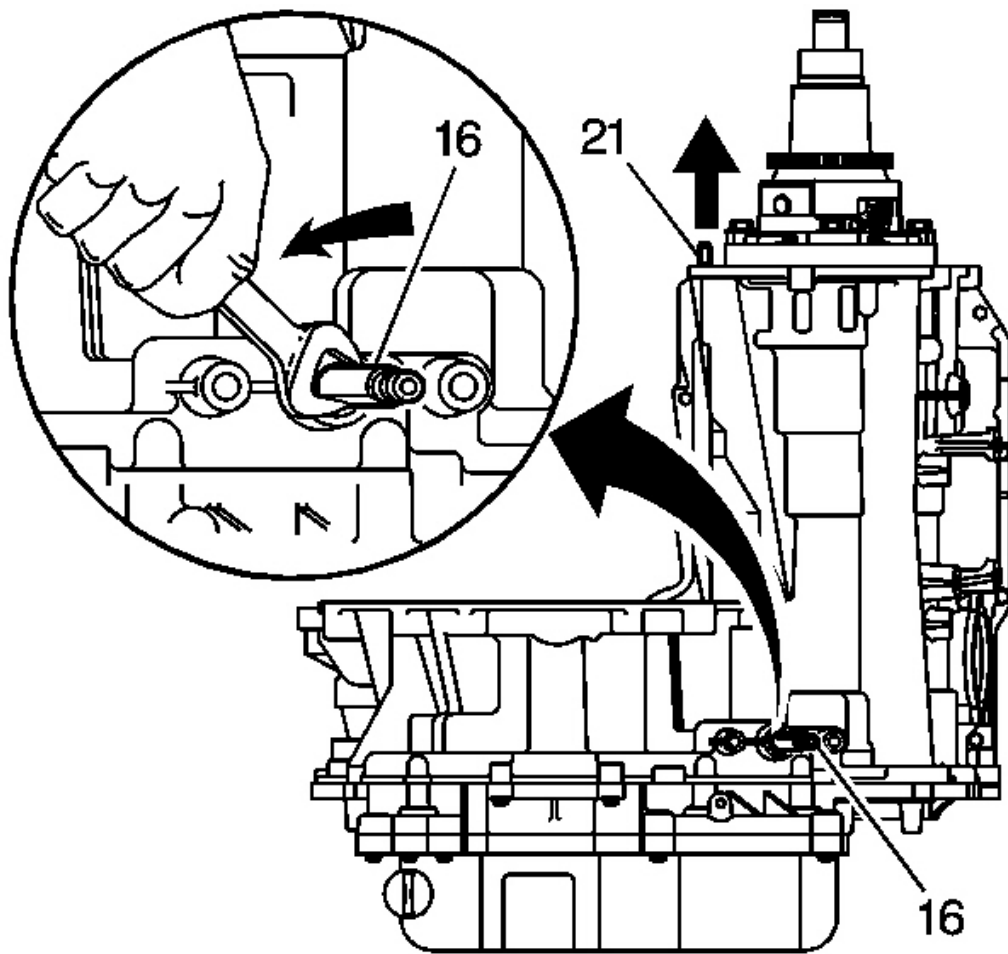


Fig. 29: Identifying Manual Shaft
Courtesy of GENERAL MOTORS CORP.

1. Rotate the manual shaft (16) counterclockwise in order to place the transmission in Park and prevent the differential from rotating.

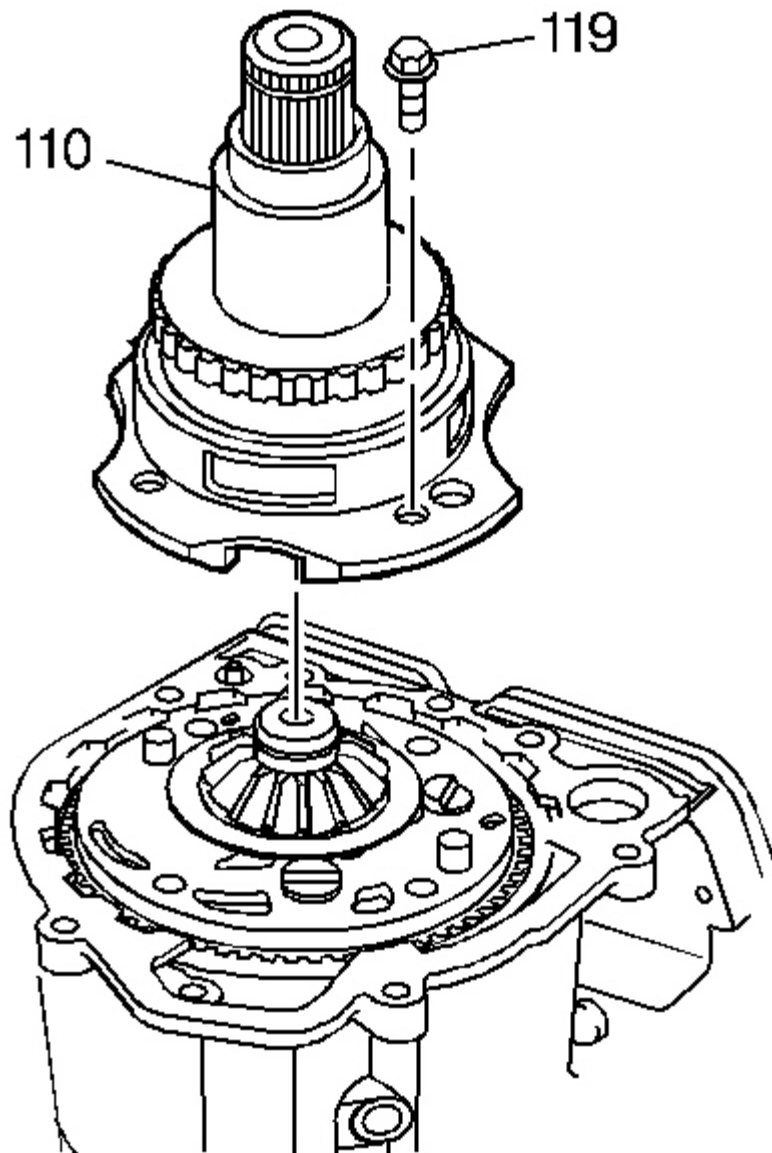


Fig. 30: Identifying Differential Carrier & Bolts
Courtesy of GENERAL MOTORS CORP.

2. Remove the four 15-mm differential bolts (119).
3. Remove the differential carrier (110).

OUTPUT SHAFT REMOVAL

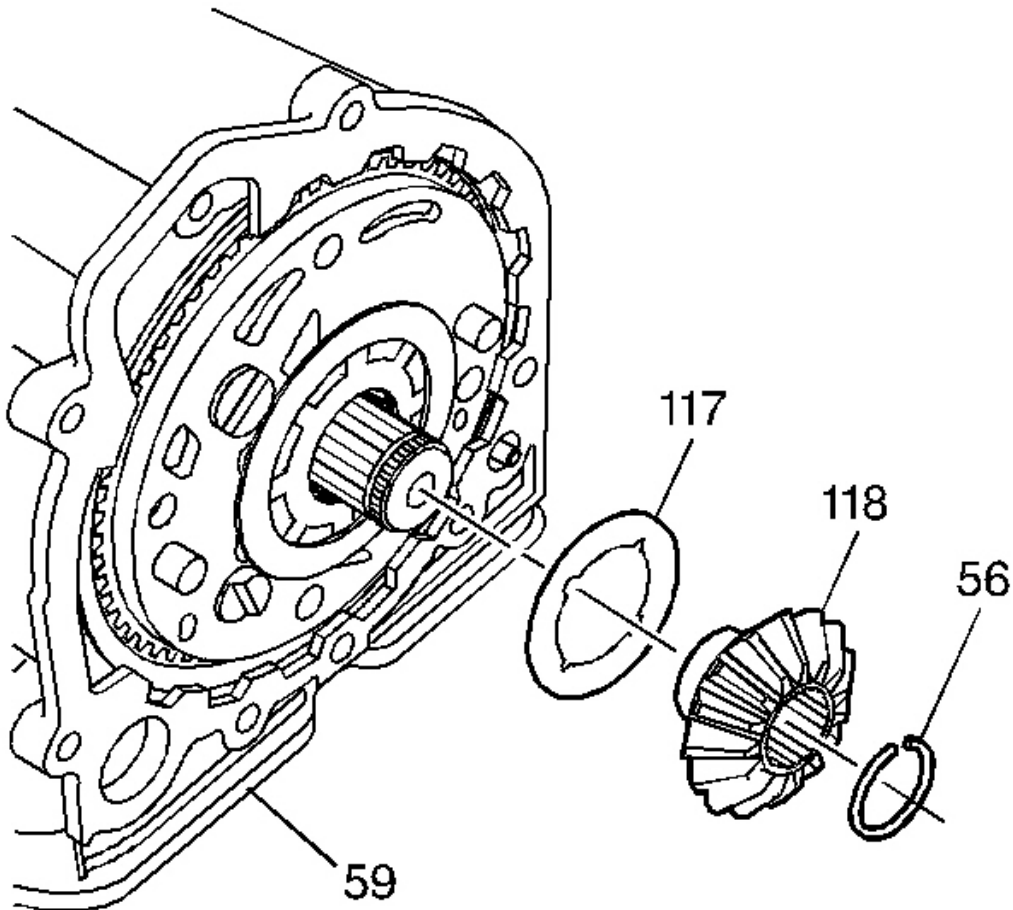


Fig. 31: Identifying Output Shaft Snap Ring, Differential Side Gear, & Thrust Washer

Courtesy of GENERAL MOTORS CORP.

1. Rotate the transmission so that the bottom pan (59) faces down.
2. Push on the output shaft in order to expose the snap ring. Remove the output shaft snap ring (56).
3. Remove the left side differential gear (118). Remove the thrust washer (117).

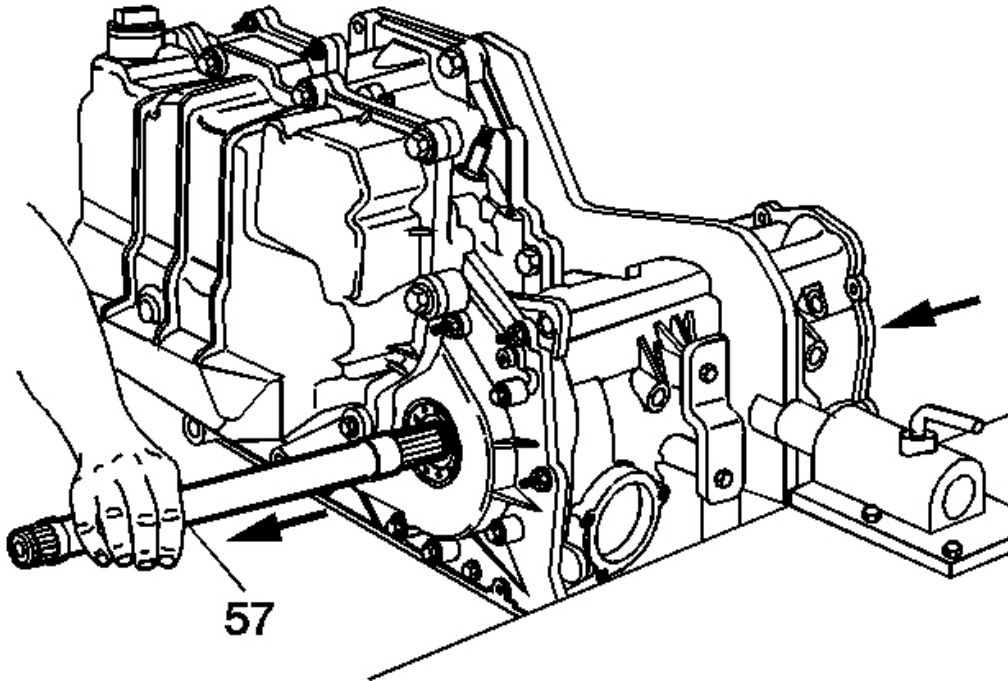


Fig. 32: Removing Output Shaft
Courtesy of GENERAL MOTORS CORP.

4. Remove the output shaft (57) through the opposite end of the case.

FINAL DRIVE CARRIER, SUN AND INTERNAL GEAR REMOVAL

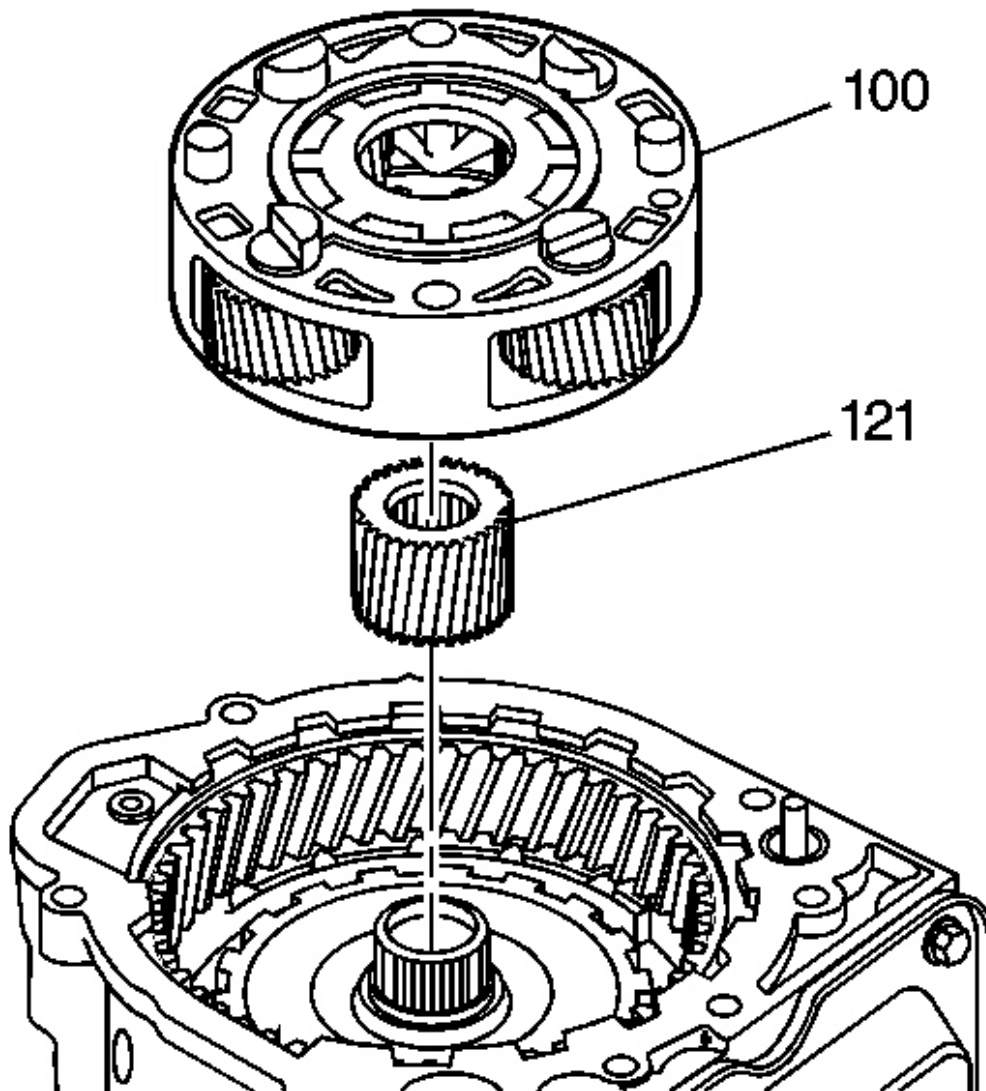


Fig. 33: Identifying Final Drive Sun Gear
Courtesy of GENERAL MOTORS CORP.

1. Rotate the transmission so the final drive carrier (100) faces up.
2. Remove the final drive carrier and the thrust bearing (100).
3. Remove the final drive sun gear (121).

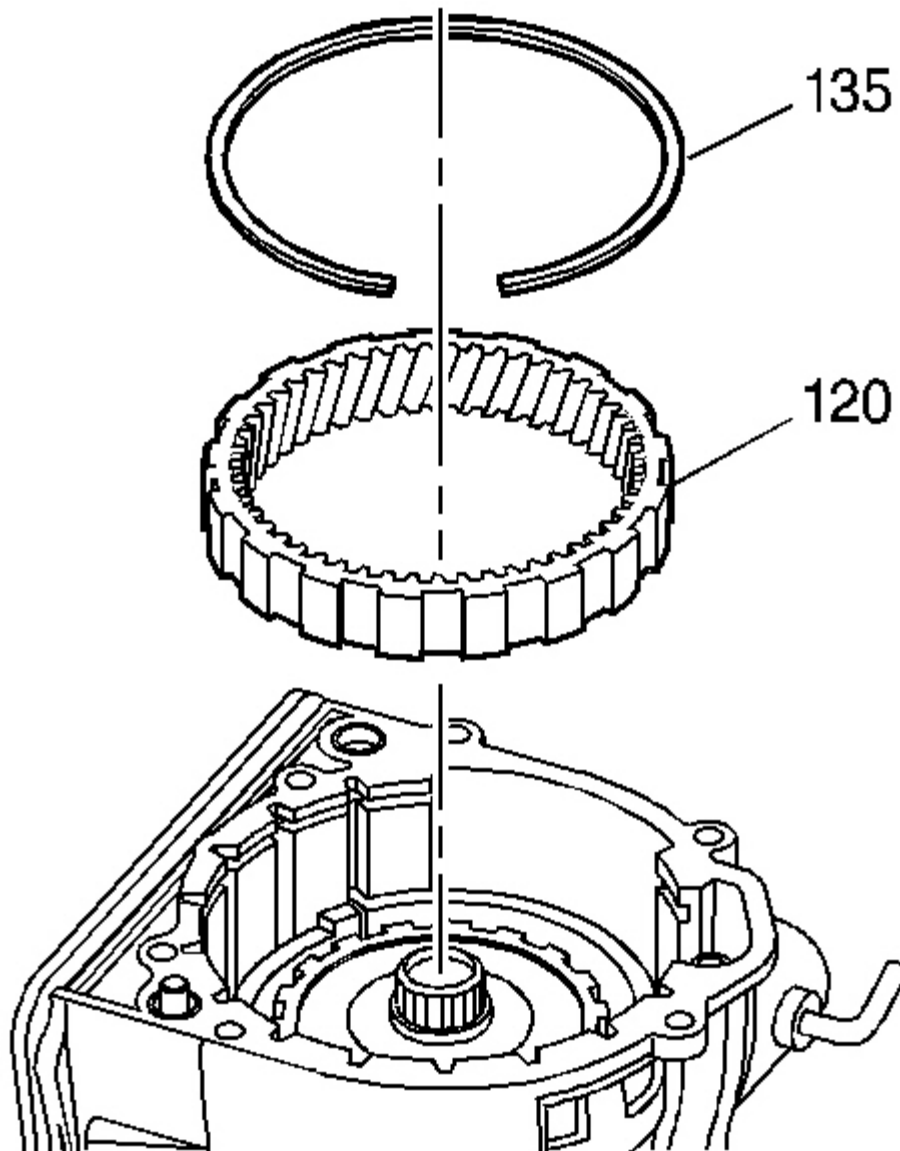


Fig. 34: View Of Final Drive Internal Gear With Groove Aligned Up
Courtesy of GENERAL MOTORS CORP.

4. Remove the final drive internal gear snap ring (135).
5. Remove the final drive internal gear (120).

BOTTOM PAN, GASKET, AND SCAVENGE SCREENS REMOVAL

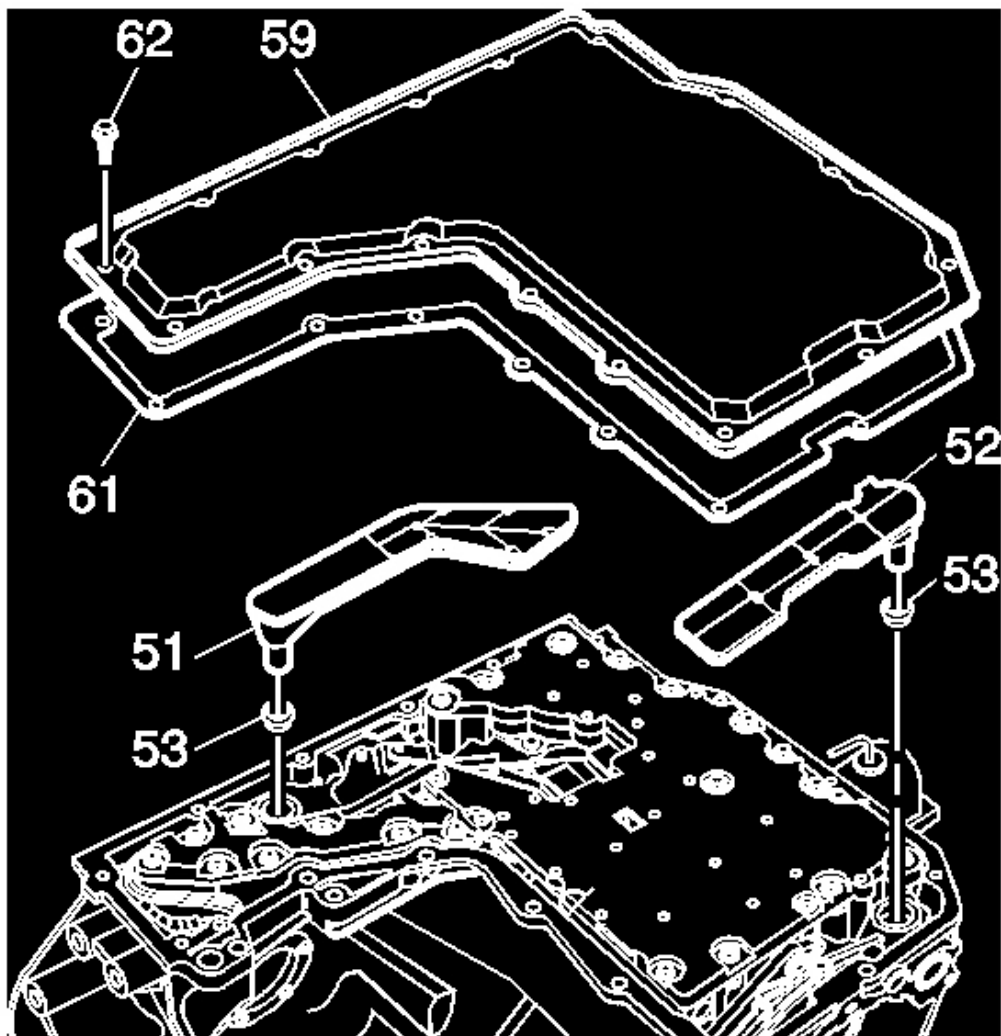


Fig. 35: View Of Bottom Pan, Scavenge Screens & Gasket
Courtesy of GENERAL MOTORS CORP.

1. Rotate the transmission so the bottom pan (59) faces up.
2. Remove the sixteen 10 mm bottom pan bolts (62).
3. Remove the bottom pan (59) and the gasket (61).

4. Remove the left scavenge screen and its seal (51, 53).
5. Remove the right scavenge screen and its seal (52, 53).

LOWER CONTROL VALVE BODY ASSEMBLY REMOVAL

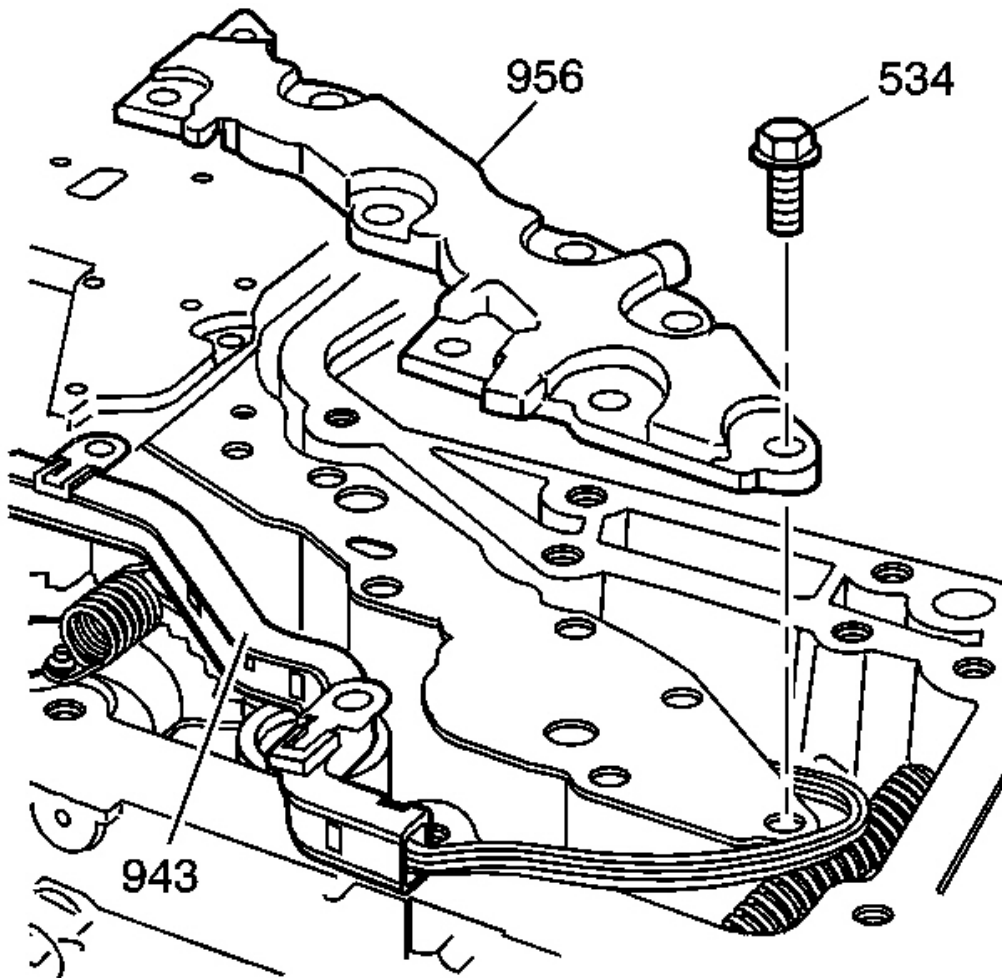


Fig. 36: Removing Oil Transfer Plate Retaining Bolts
Courtesy of GENERAL MOTORS CORP.

1. Remove the nine 10 mm bolts (534) from the oil transfer plate (956) and wire harness assembly (943).
2. Remove the oil transfer plate (956).

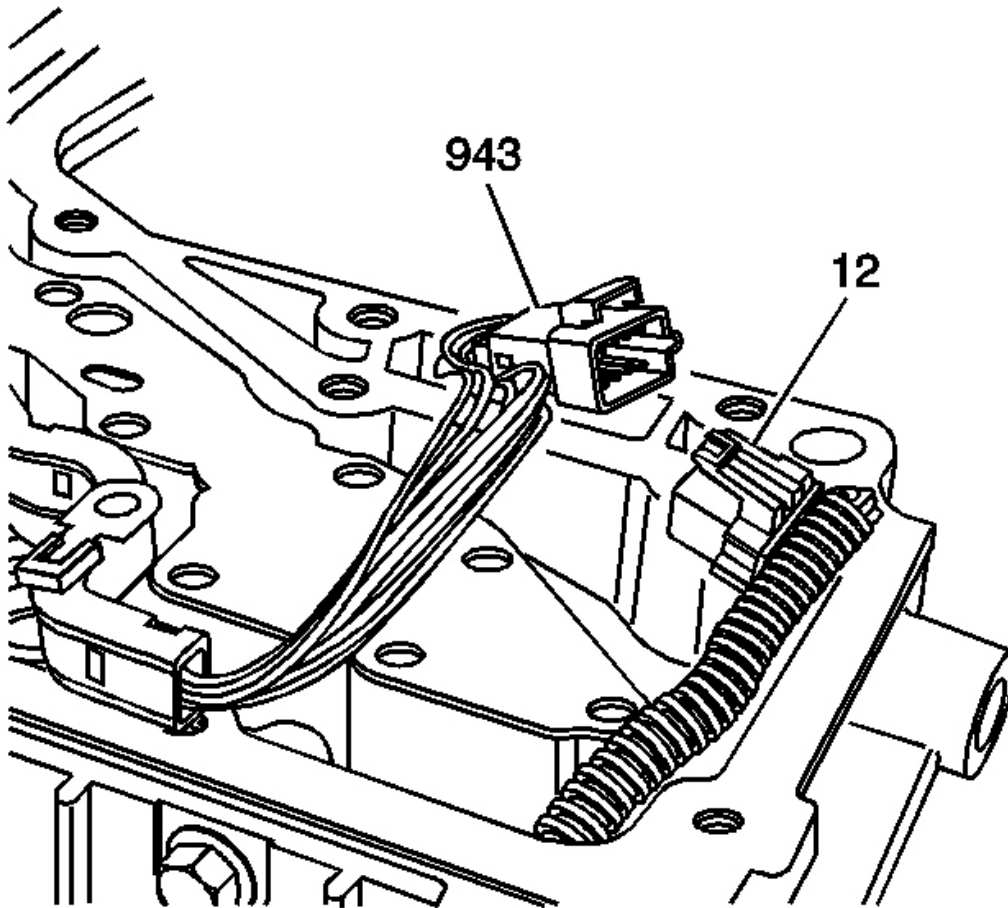


Fig. 37: Disconnecting Wire Harness Extension
Courtesy of GENERAL MOTORS CORP.

3. Disconnect the wire harness extension (943) from the wire harness assembly (12).

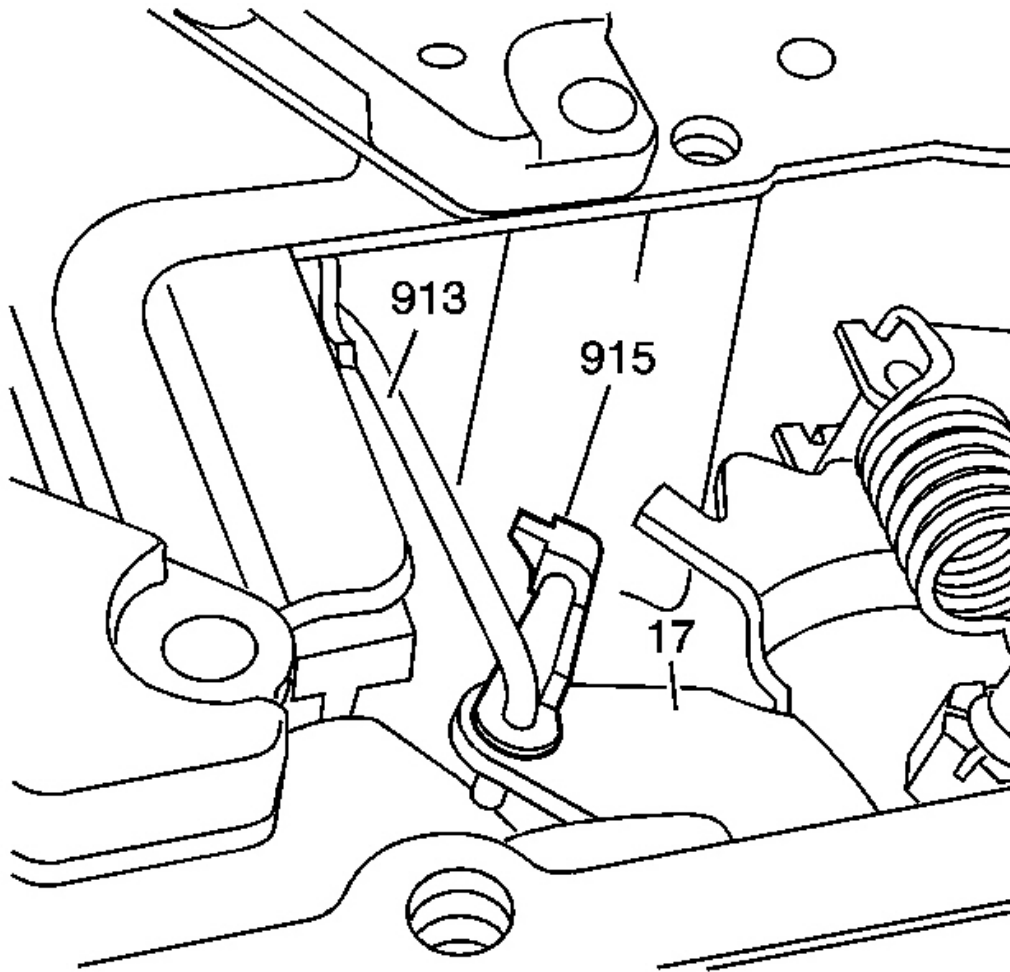


Fig. 38: Manual Valve Link
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not reuse retainer (915), it must be replaced.

4. Use a small screwdriver in order to disconnect the manual valve link retainer (915) from the manual valve link (913).

IMPORTANT: Do not pry against the internal mode switch assembly.

5. Lift the manual valve and link assembly link (916) out of the inside detent lever (17).

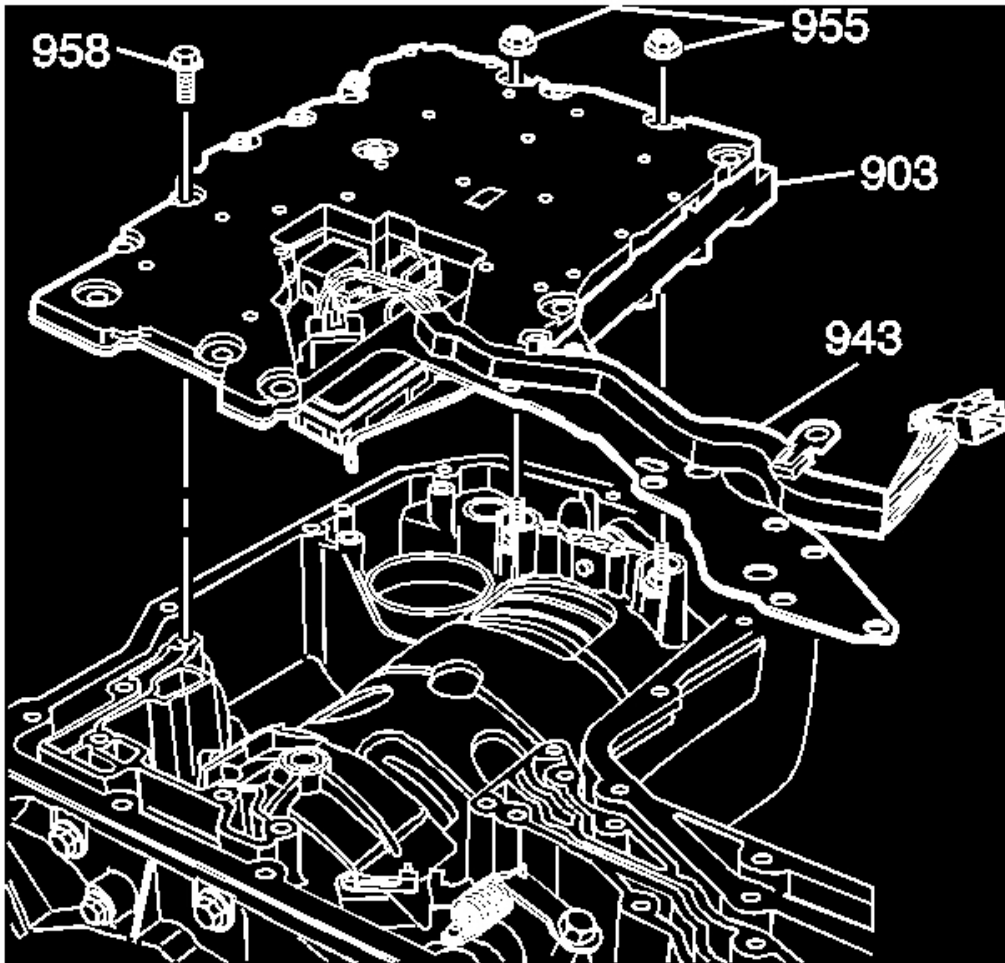


Fig. 39: Identifying Lower Channel Plate, Control Valve Body And Accumulator Assembly, And Lower Control Valve Body Wire Harness Extension
Courtesy of GENERAL MOTORS CORP.

6. Remove the two 10 mm nuts (955) and the fourteen 10 mm bolts (958) from the lower control valve body assembly (903).
7. Lift the lower channel plate, control valve body and accumulator assembly (903) and the lower control valve body wire harness extension (943) from the case as a single unit.

INPUT SHAFT END PLAY MEASUREMENT

Tools Required

- **J 39686** Input End Play Check Tool. See Special Tools.
- **J 25025-7A** Dial Indicator Post
- **J 8001** Dial Indicator

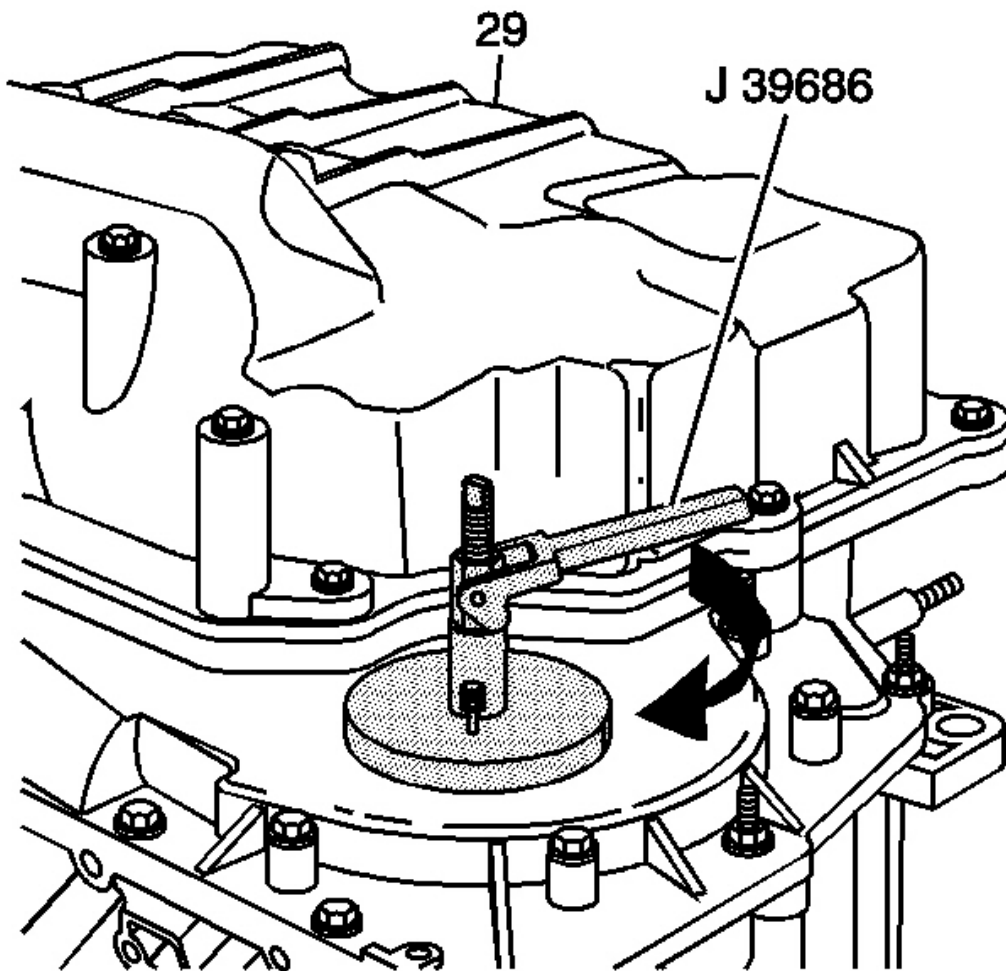


Fig. 40: Installing J 39686 & J 25025-7A To Transmission Case
Courtesy of GENERAL MOTORS CORP.

1. Rotate the transmission so the side cover (29) faces up.
2. Install the **J 39686** into the case barrel. See Special Tools. Install the **J 25025-7A** .

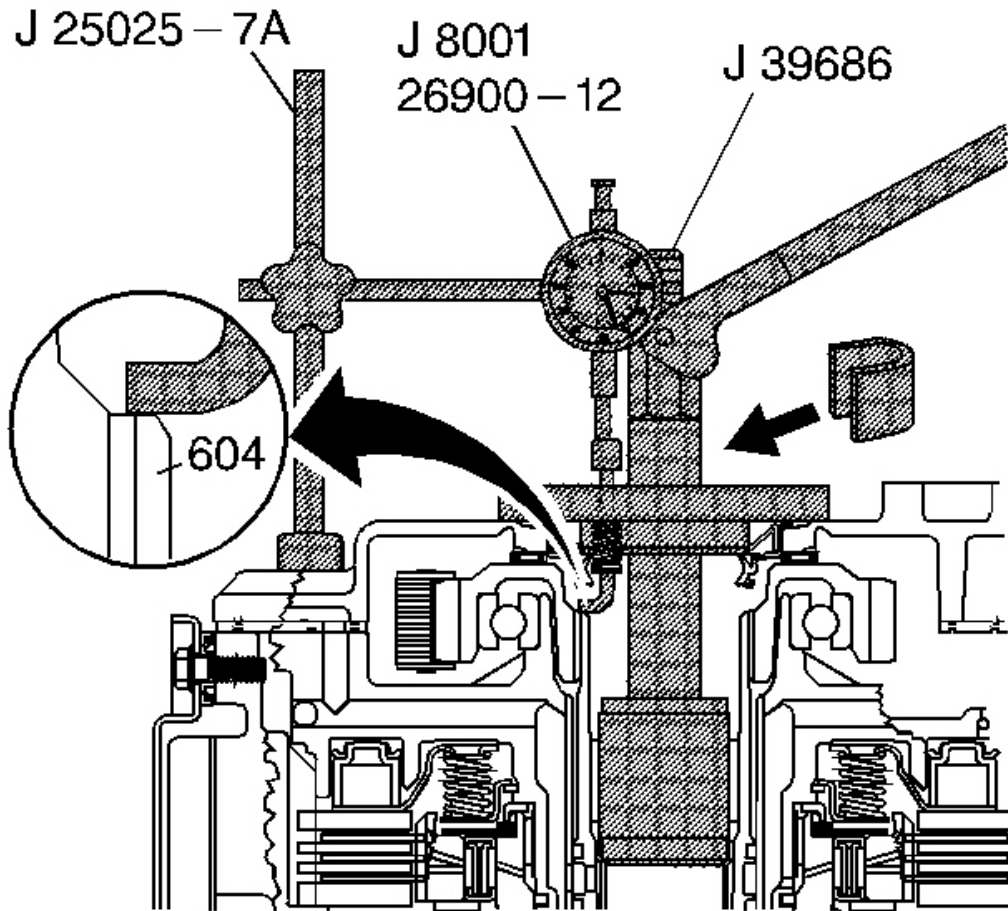


Fig. 41: Locating The J Tab On The Input Shaft
 Courtesy of GENERAL MOTORS CORP.

3. Locate the J tab of the **J 39686** on the input shaft (604). See Special Tools. The arrow on the J tab should have a 90 degree orientation.

IMPORTANT: The washer of the **J 39686** must rest flat on the case cover seal. See Special Tools.

4. Rotate the threaded shaft of the **J 39686** clockwise until the shaft is tight. See Special Tools. Leave enough space for the collar.
5. Insert the collar. Install the **J 8001**.

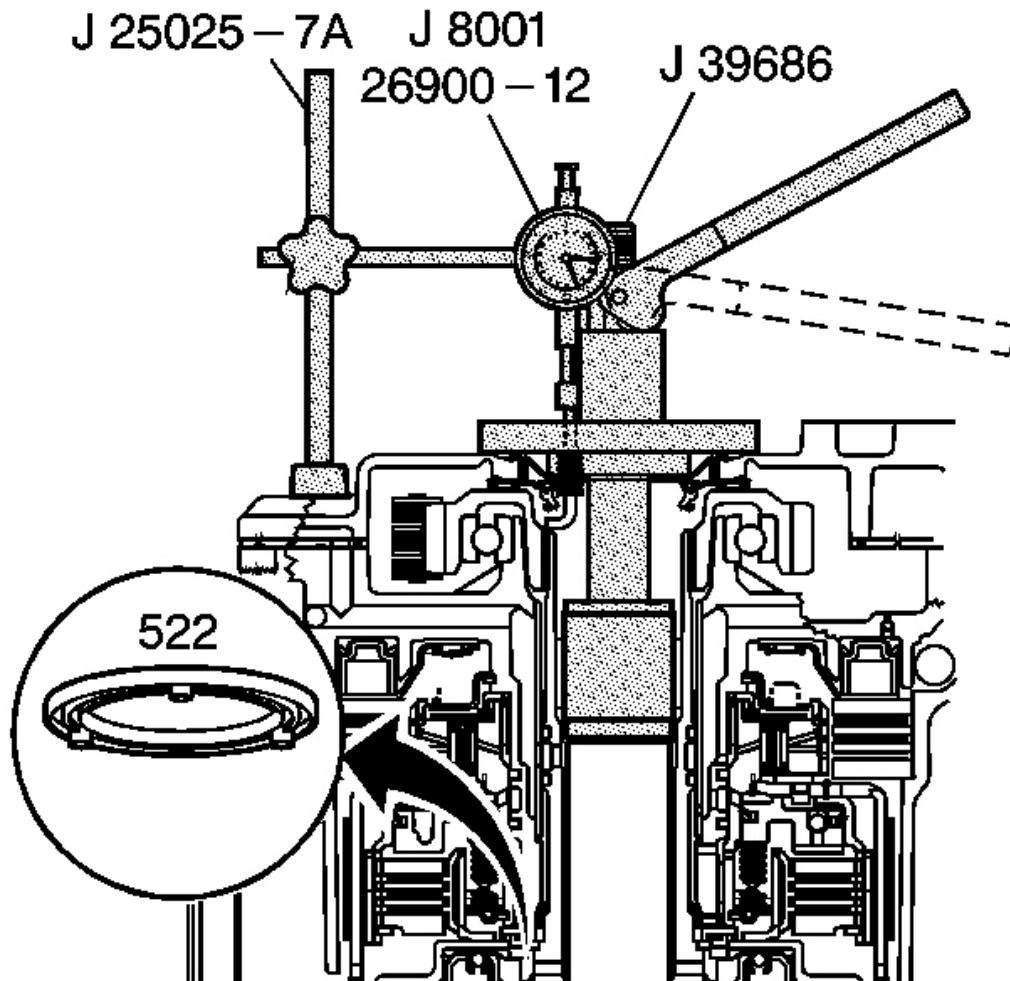


Fig. 42: Checking End Play Using J 39686
Courtesy of GENERAL MOTORS CORP.

6. Push down on the handle of the **J 39686** and check the end play. See **Special Tools**.

Specification: End play should be 0.10-0.85 mm (0.004-0.033 in).

If the measurement is out of the specification range, determine the appropriate selective thrust washer (522) for installation when you reassemble the input shaft.

7. Remove the **J 8001** , the **J 25025-7A** and the **J 39686** . See **Special Tools**.

SIDE COVER, GASKET, AND FILTER REMOVAL

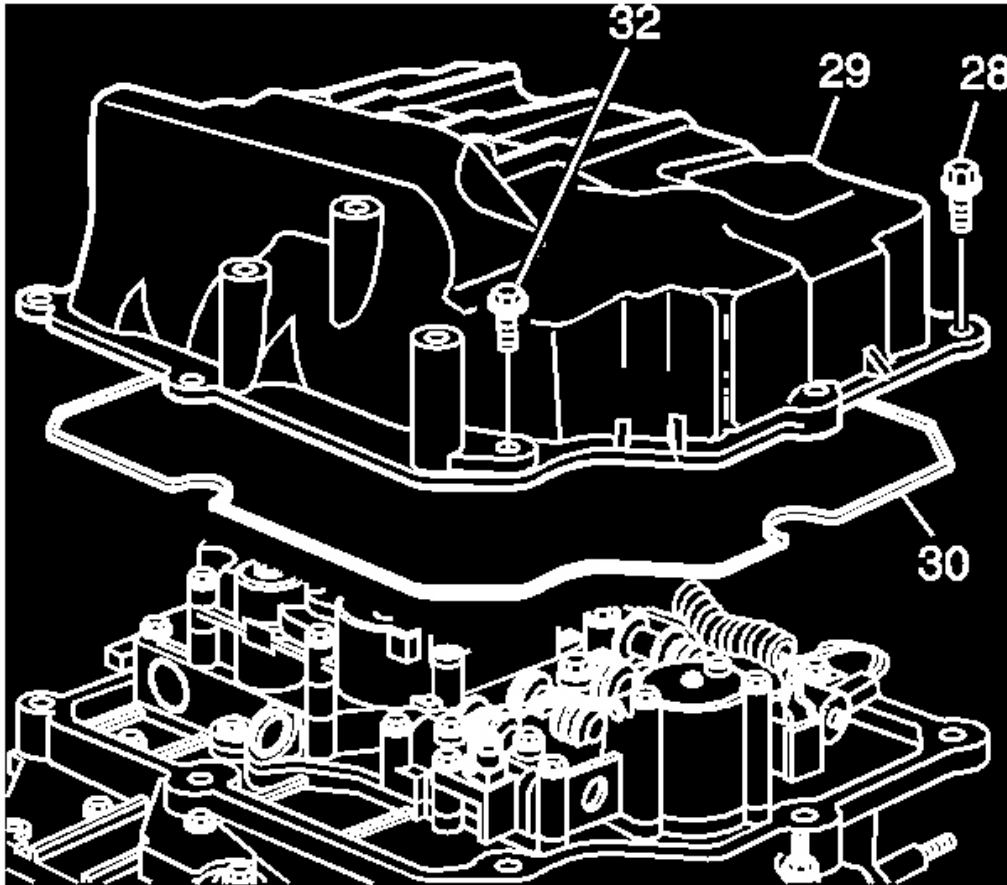


Fig. 43: Locating Side Cover & Gasket
Courtesy of GENERAL MOTORS CORP.

1. Remove the eight 15 mm bolts (28) and the one 13 mm bolt (32) from the side cover (29).
2. Remove the side cover (29) and the gasket (30).

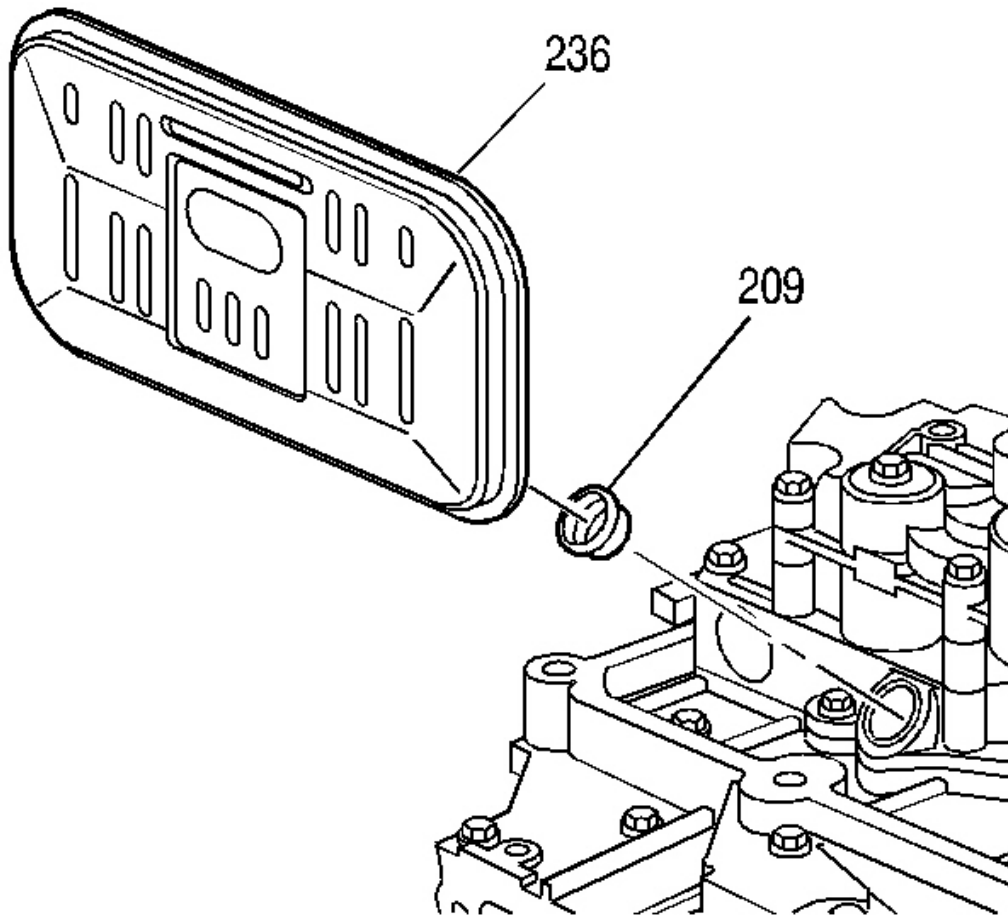


Fig. 44: View Of Oil Filter & Seal
Courtesy of GENERAL MOTORS CORP.

3. Remove the main filter (236) and the seal (209).

OIL PUMP, UPPER CONTROL VALVE ASSEMBLY REMOVAL

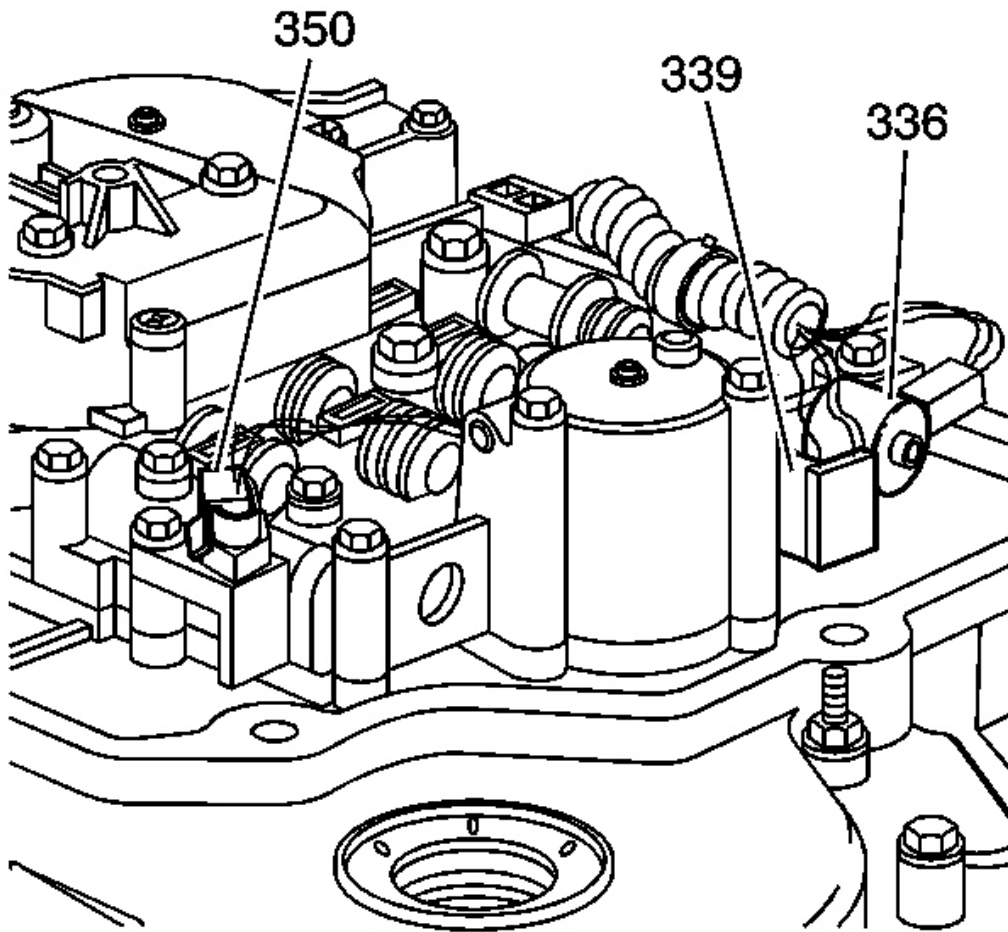


Fig. 45: View Of Pressure Control Solenoid Valve, Torque Converter Clutch Solenoid Valve & Transmission Temperature Sensor Electrical Connectors
Courtesy of GENERAL MOTORS CORP.

1. Using a small screwdriver, disconnect the following parts:
 - The electrical connector from the automatic transmission fluid temperature sensor (350)
 - The torque converter clutch solenoid valve (336)
 - The pressure control solenoid valve (339)

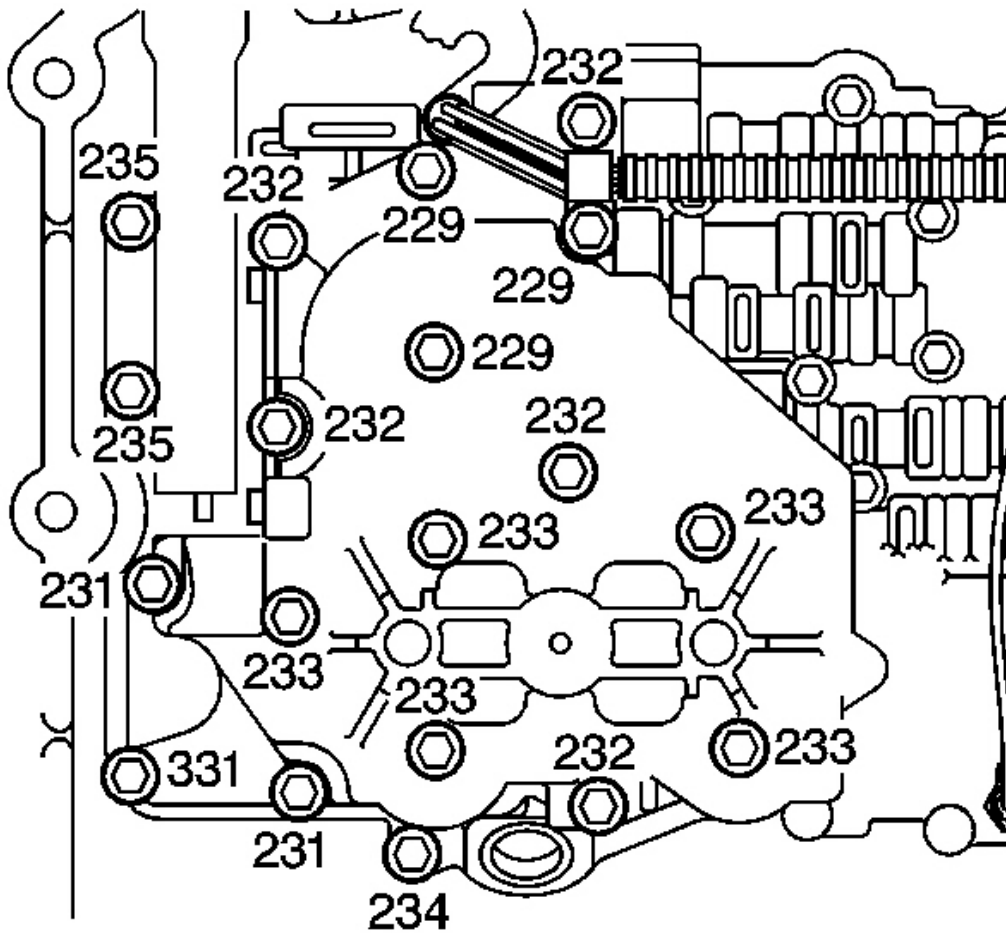


Fig. 46: Identifying Pump Housing Bolts
Courtesy of GENERAL MOTORS CORP.

2. Remove the 19 8-mm bolts (229, 231, 232, 233, 234, 235, 331) from the pump housings.

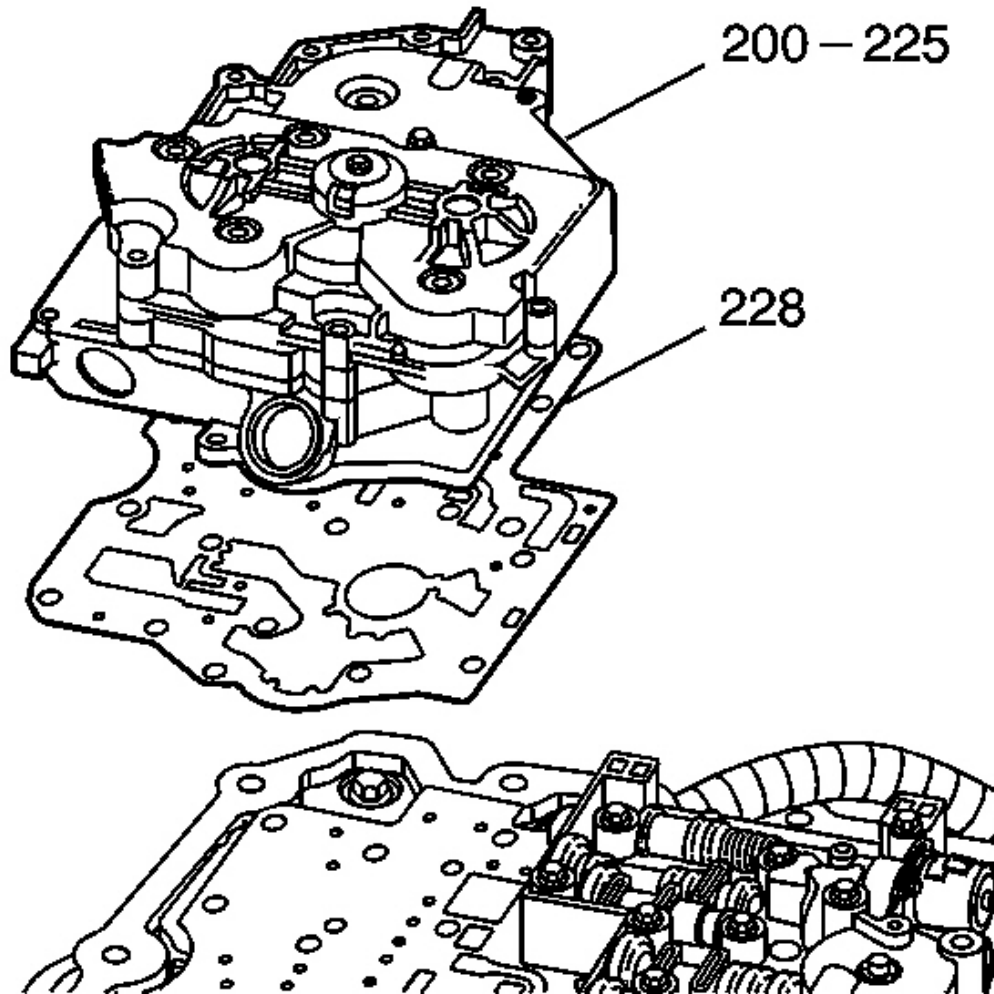


Fig. 47: View Of Scavenge, Primary And Secondary Pump Assemblies
Courtesy of GENERAL MOTORS CORP.

3. Remove the scavenge, the primary and the secondary pump assemblies as one unit (200-225).
4. Remove the pump gasket (228).

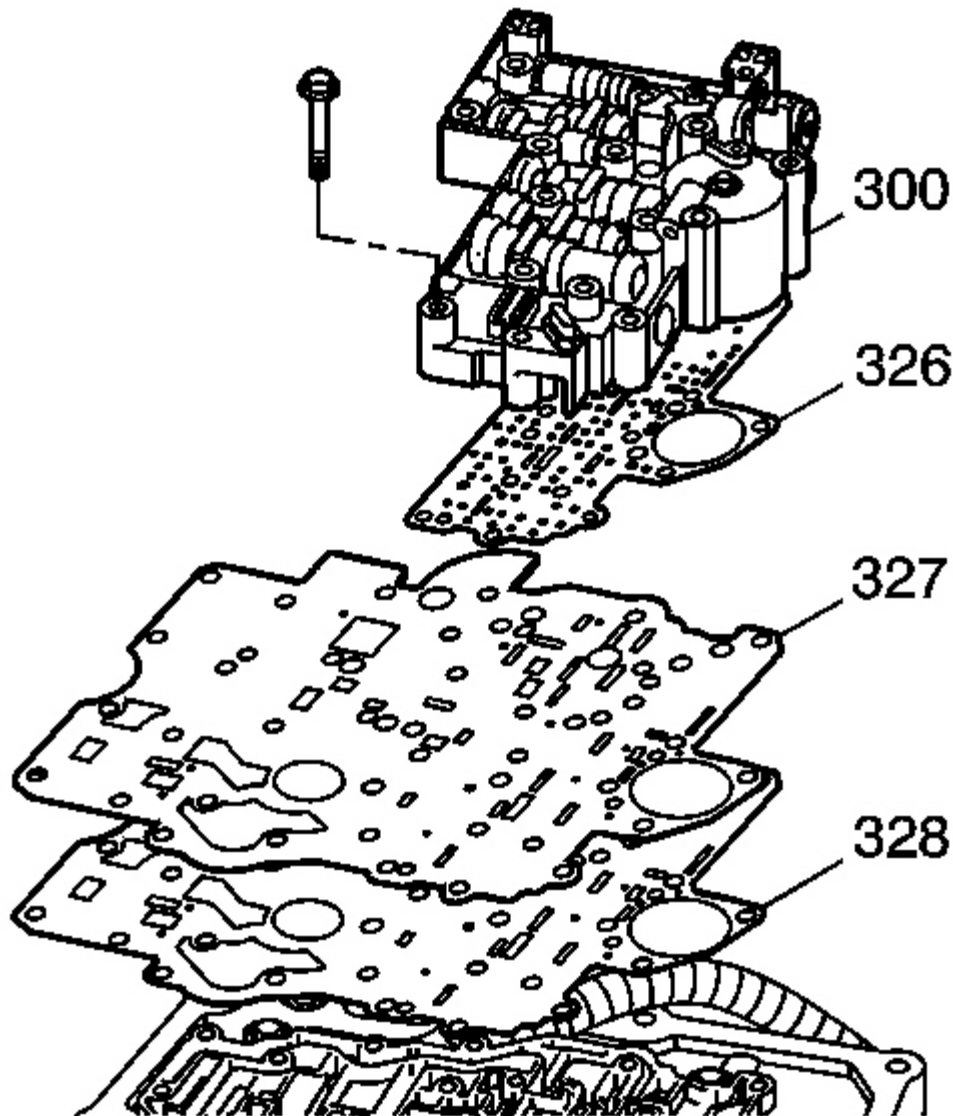


Fig. 48: View Of Upper Control Valve Assembly Components
Courtesy of GENERAL MOTORS CORP.

5. Remove the seventeen 8-mm bolts from the upper control valve body assembly.
6. Remove the following parts:
 - The upper control valve body assembly (300)

- The spacer plate (327)
- The gaskets (326, 328)

CASE COVER REMOVAL

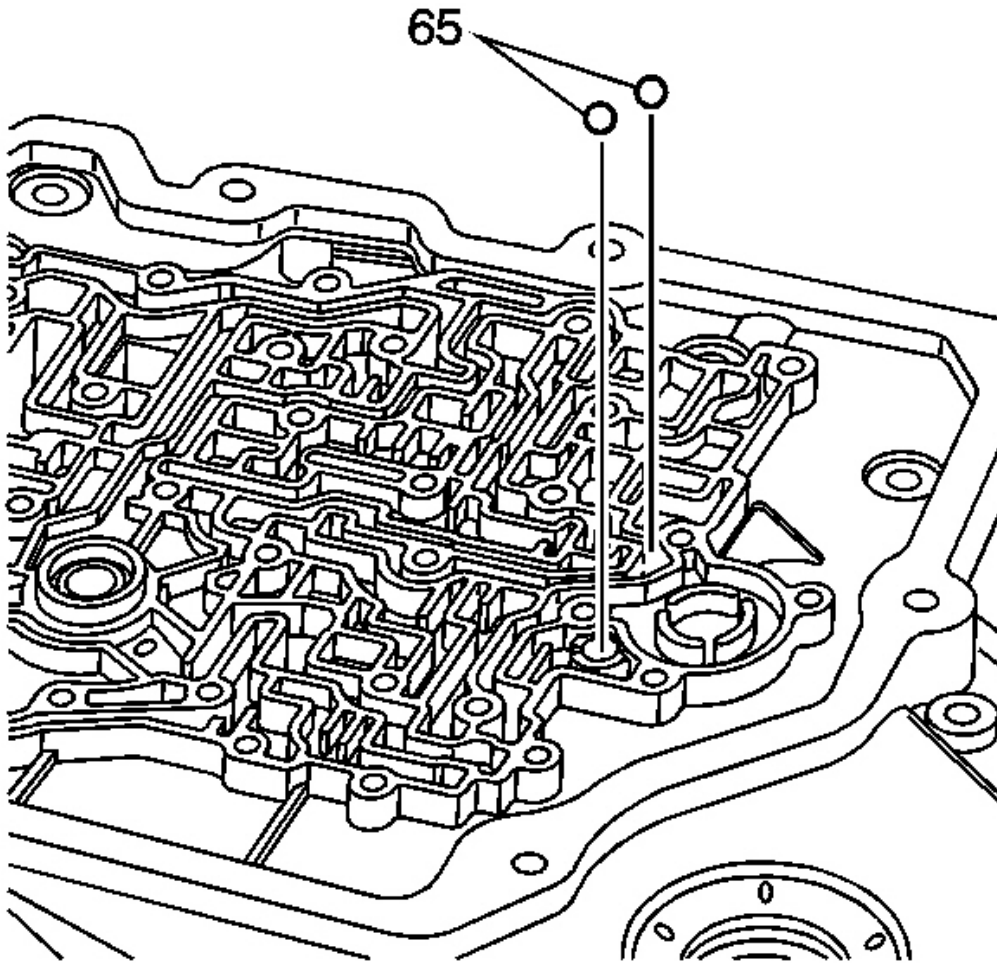


Fig. 49: Identifying Case Cover Checkballs
Courtesy of GENERAL MOTORS CORP.

1. Remove the two checkballs from the case cover (65).

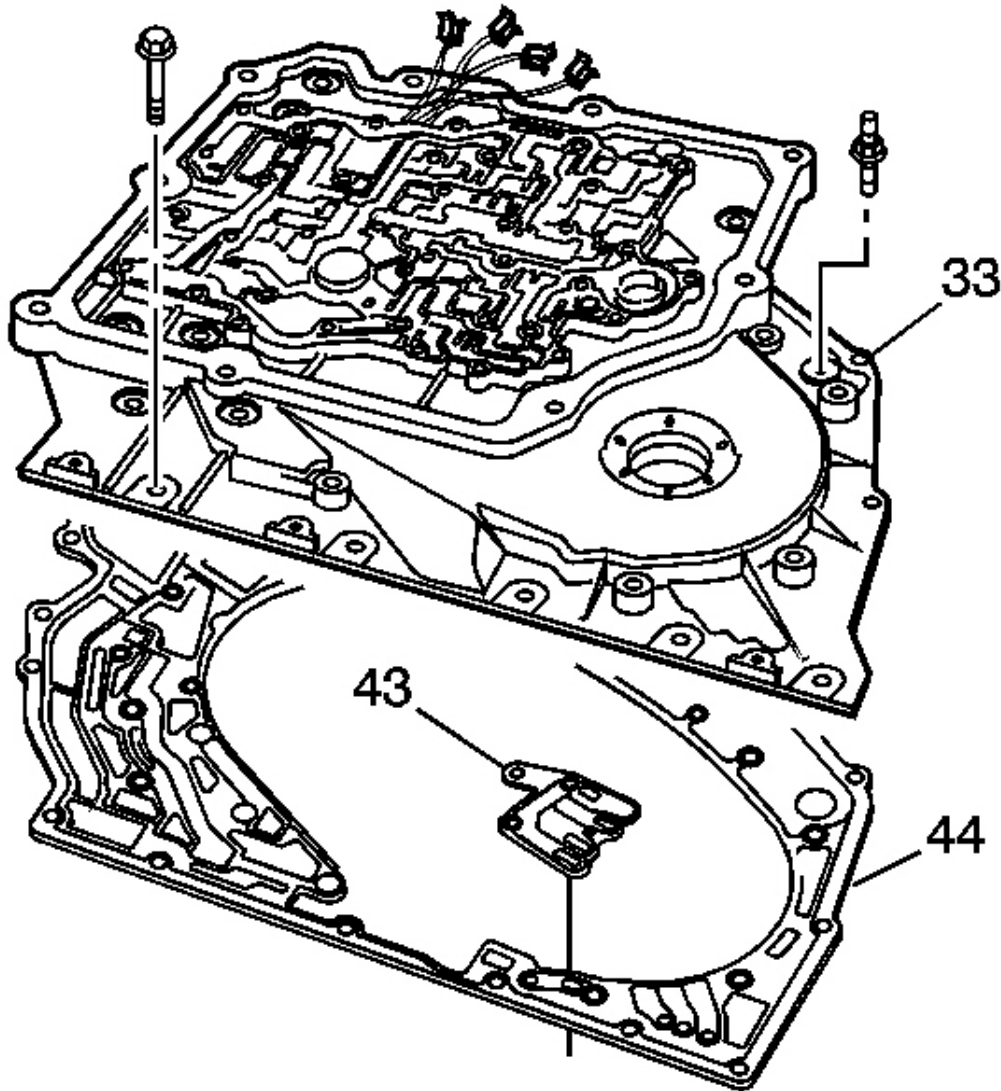


Fig. 50: View Of Island Gasket & Case Cover Gasket
Courtesy of GENERAL MOTORS CORP.

2. Remove the 26 case cover bolts and studs.
3. Remove the case cover assembly (33). Gently guide the ends of the wire harness through the opening in the case cover (33). The harness will remain in the case.
4. Remove the case cover gasket (44) and remove the island gasket (43).

DRIVE/DRIVEN SPROCKET AND CHAIN REMOVAL

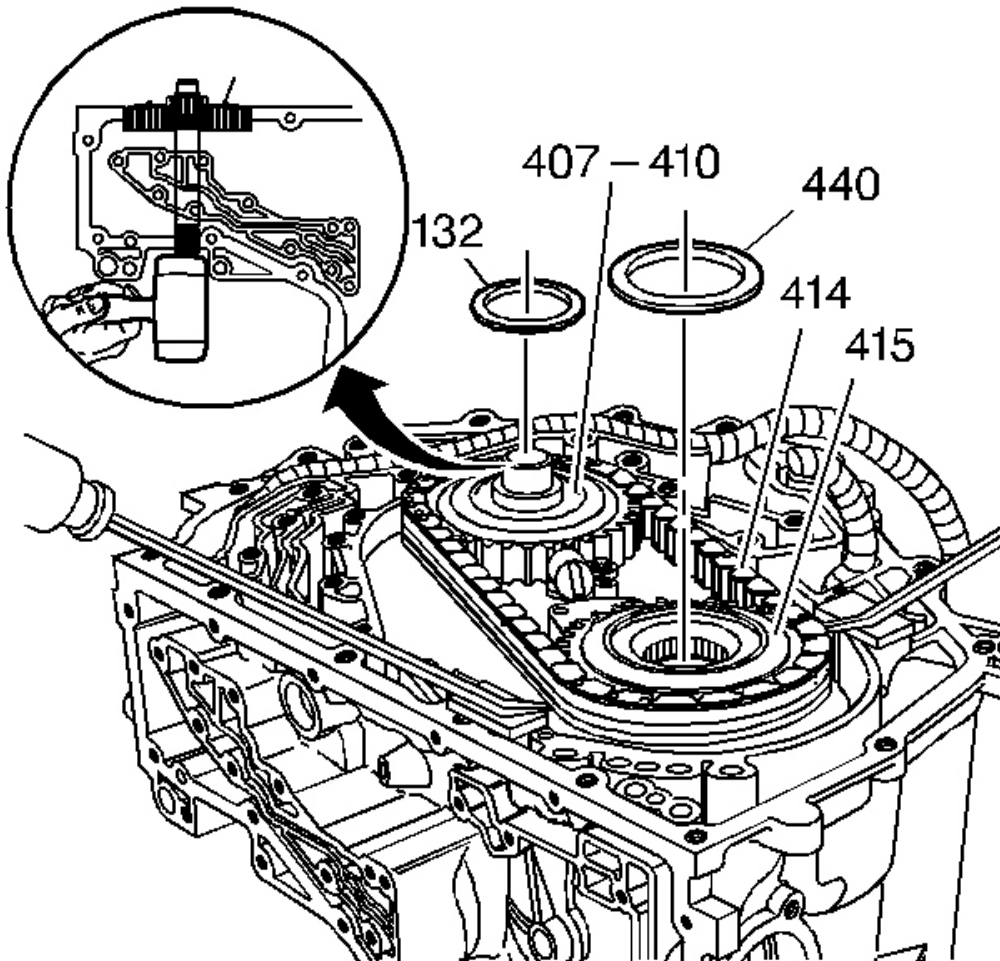


Fig. 51: Expanded View Of Drive Sprocket And Turbine Shaft Assembly
Courtesy of GENERAL MOTORS CORP.

1. Remove the thrust bearings (132, 440) from the drive and driven sprockets).
2. Remove the following parts:
 - The drive sprocket and turbine shaft assembly (407-410)
 - The driven sprocket (415)

IMPORTANT: Mark the chain in order to indicate the direction in which

you removed the chain.

- Remove the chain (414)
3. Use two screwdrivers in order to hold the driven sprocket in place, and pry off the driven sprocket. Place small blocks of wood or pieces of plastic under the screwdrivers in order to protect the case. Use a plastic hammer in order to tap the drive sprocket and the turbine shaft.

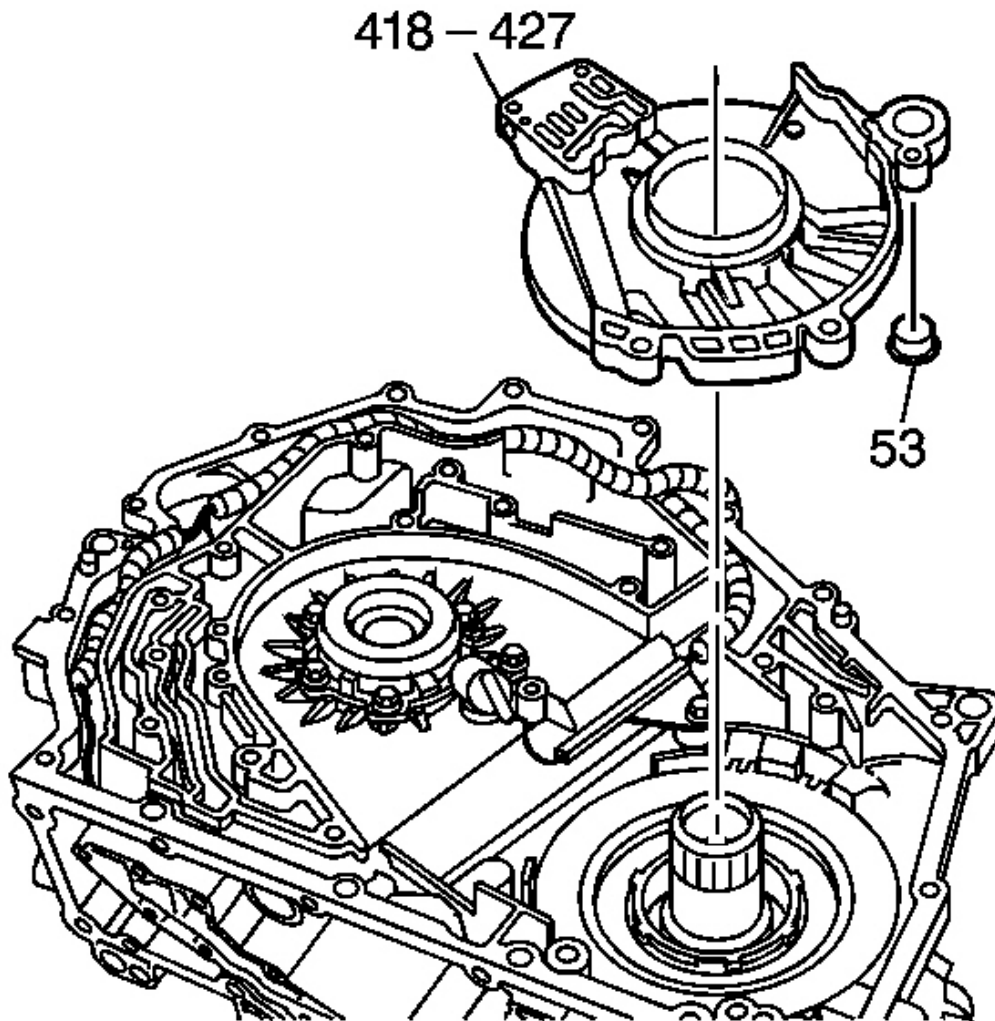


Fig. 52: Identifying Driven Sprocket Support

Courtesy of GENERAL MOTORS CORP.

4. Remove the driven sprocket support assembly (418-427)
5. Inspect the scavenge tube case area for a dislodged seal (53) which may have become dislodged from the driven sprocket support assembly (418-427) when the scavenge tube was previously removed.

INPUT SPEED SENSOR AND WIRING HARNESS REMOVAL

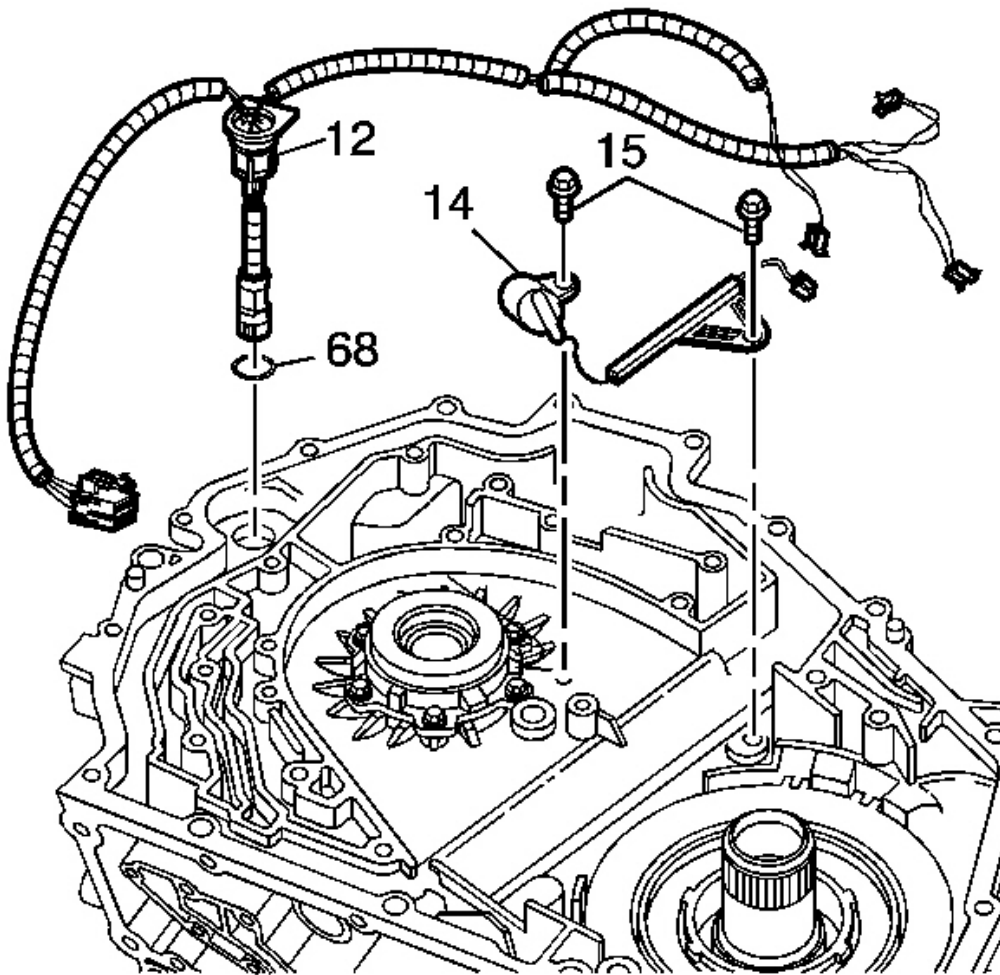


Fig. 53: View Of Automatic Transmission Wiring Harness Assembly Retaining Bolts
Courtesy of GENERAL MOTORS CORP.

1. Remove the two 8 mm bolts (15) from the automatic transmission input (shaft) speed (A/T ISS) sensor and the retainer.
2. Disconnect the A/T ISS (14) and the harness.
3. Remove the pass through connector and the automatic transmission wiring harness assembly (12) and O-ring (68) from the case. Remove by pushing the three tabs inward from the outside of the case.

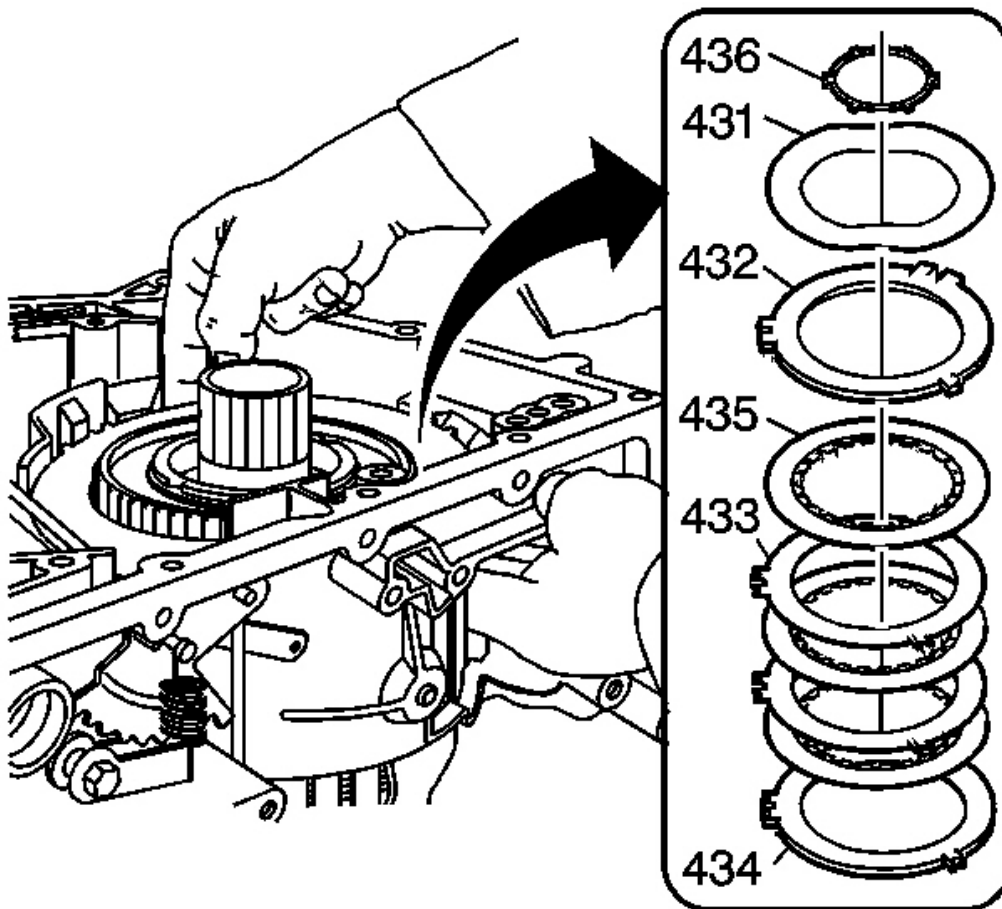
SECOND CLUTCH PLATES AND REVERSE CLUTCH REMOVAL

Fig. 54: View Of Second Clutch Plates
Courtesy of GENERAL MOTORS CORP.

1. Remove the second clutch steel assembly (431-435). Push up near the scavenge tube channel and the bottom pan side.
2. Remove the reverse clutch support thrust washer (436).

FOURTH BAND AND THIRD CLUTCH/REACTION SHELL REMOVAL

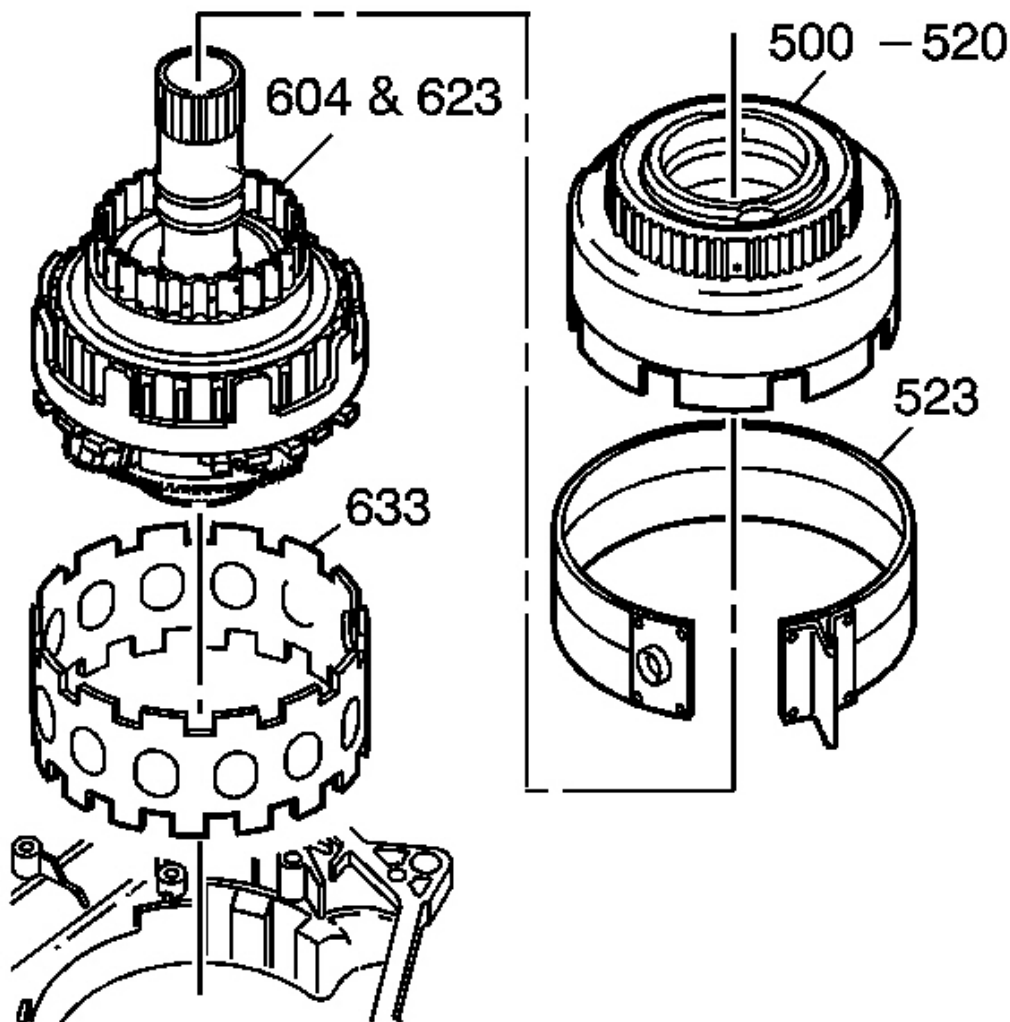
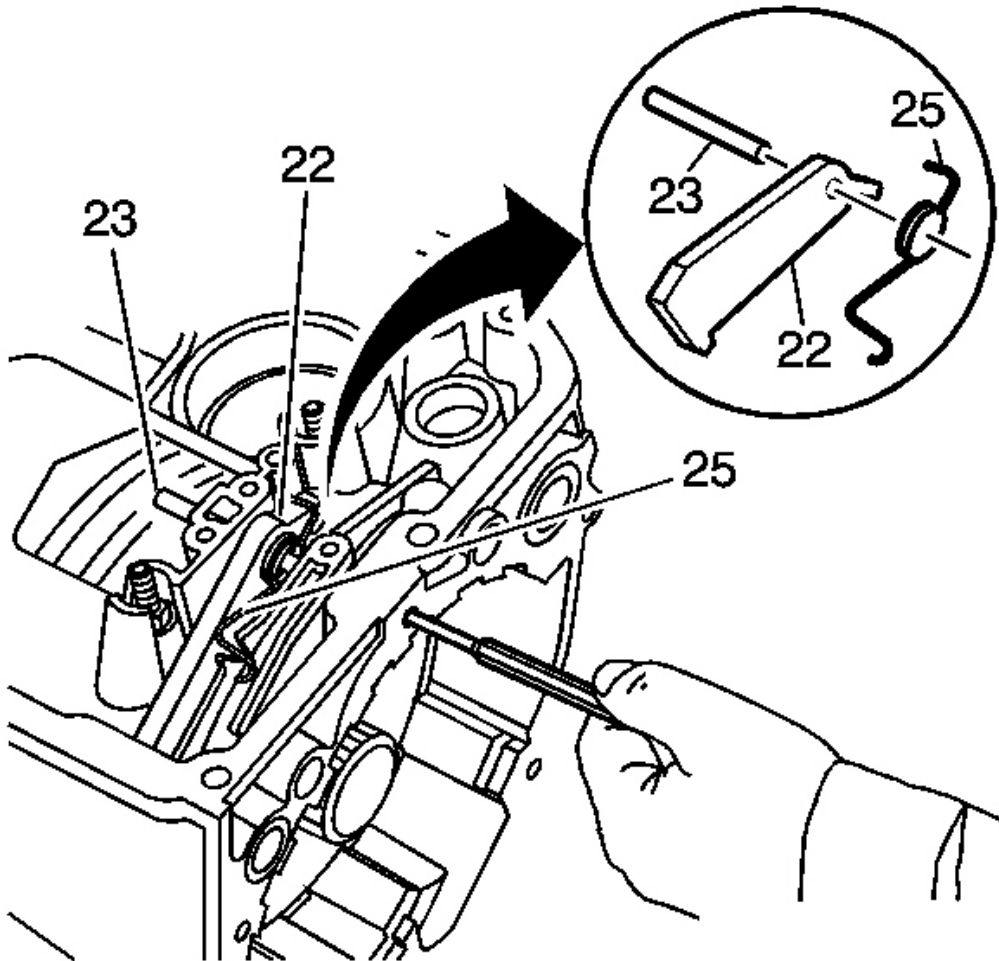


Fig. 55: Locating Reverse Clutch Housing & Second Sprag Assembly
Courtesy of GENERAL MOTORS CORP.

1. Remove the reverse clutch housing and the second sprag assembly (500-520). Grasp the second sprag race to remove.
2. Remove the 4th band (523).
3. Remove the third clutch and the reaction carrier assemblies. Grasp the input shaft to remove the third clutch and reaction carrier assembly (604, 623).
4. Remove the reaction carrier shell (633).

PARKING PAWL REMOVAL**Fig. 56: Expanded View Of Parking Pawl, Spring & Pivot Pin**

2006 Buick Lucerne CXS
2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Courtesy of GENERAL MOTORS CORP.

1. Move the manual shaft out of the Park position.
2. Push the parking pawl pivot pin (23) towards the side cover with a pin punch. Push down on the spring while driving the pin out. Remove the pivot pin.
3. Remove the parking pawl (22) and remove the spring (25).

FORWARD CLUTCH ASSEMBLY AND LOW REVERSE BAND REMOVAL

Tools Required

J 39053 Forward and Coast Clutch Assembly Puller. See **Special Tools**.

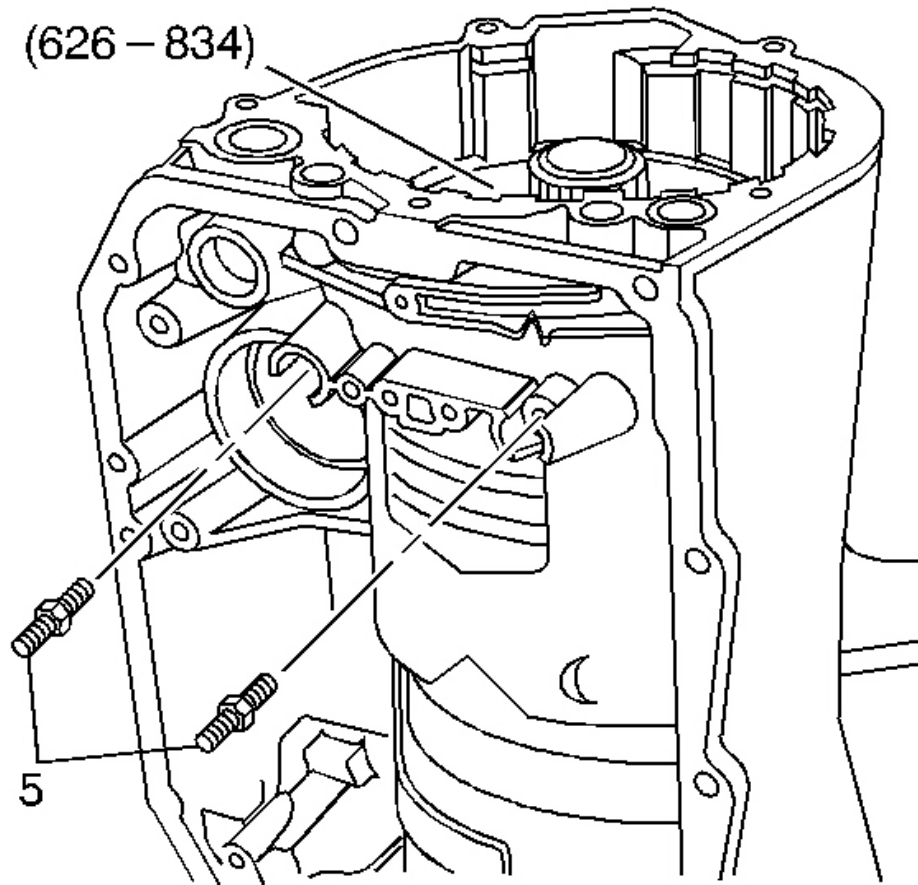


Fig. 57: Removing Forward Clutch Support Bolts
Courtesy of GENERAL MOTORS CORP.

1. Rotate the transmission so that the forward clutch assembly (626-834) faces up.
2. Remove the two 13-mm forward clutch support bolts (5) from the case.

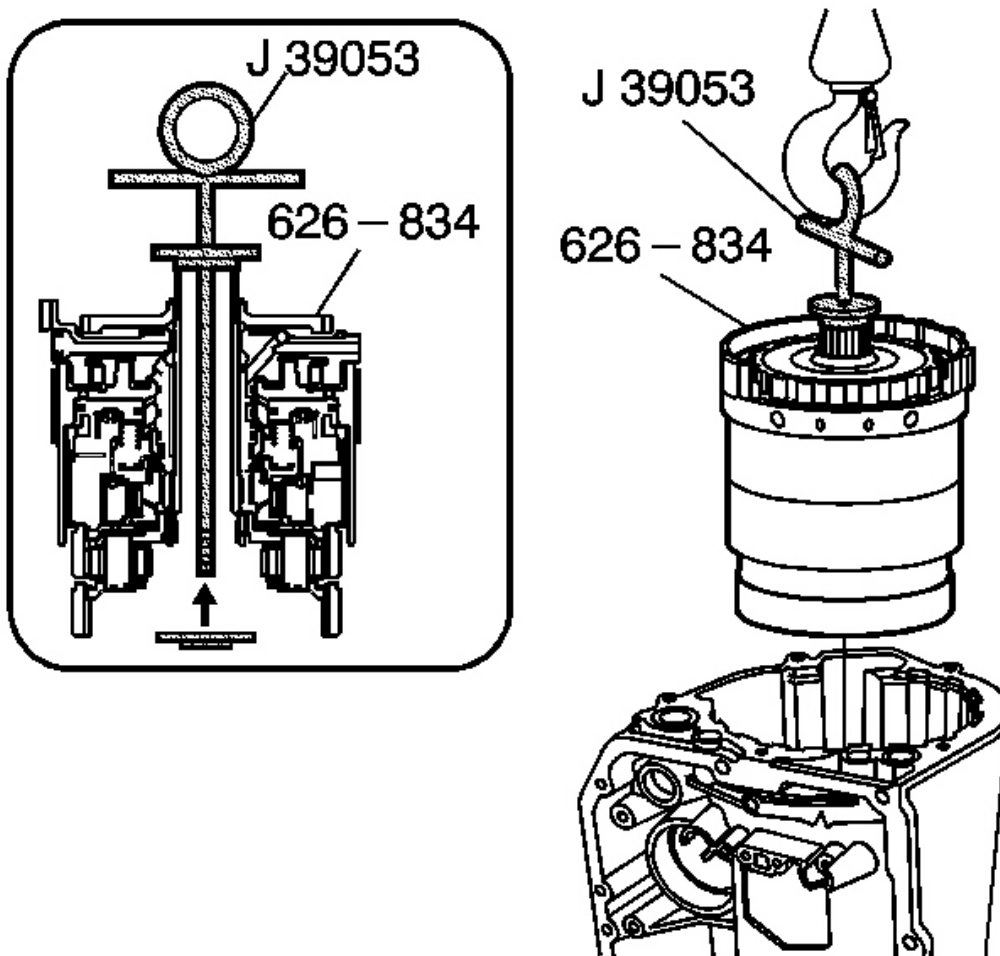


Fig. 58: Securing & Lifting Forward And Coast Clutch Assembly
Courtesy of GENERAL MOTORS CORP.

CAUTION: The forward and coast clutch assembly weighs approximately 50 lbs. Personal injury may result if you drop the assembly.

3. Install the **J 39053** . See **Special Tools**. Using a chain hoist or suitable lifting equipment, secure and lift the forward and coast clutch assembly (626-834) out of the case.

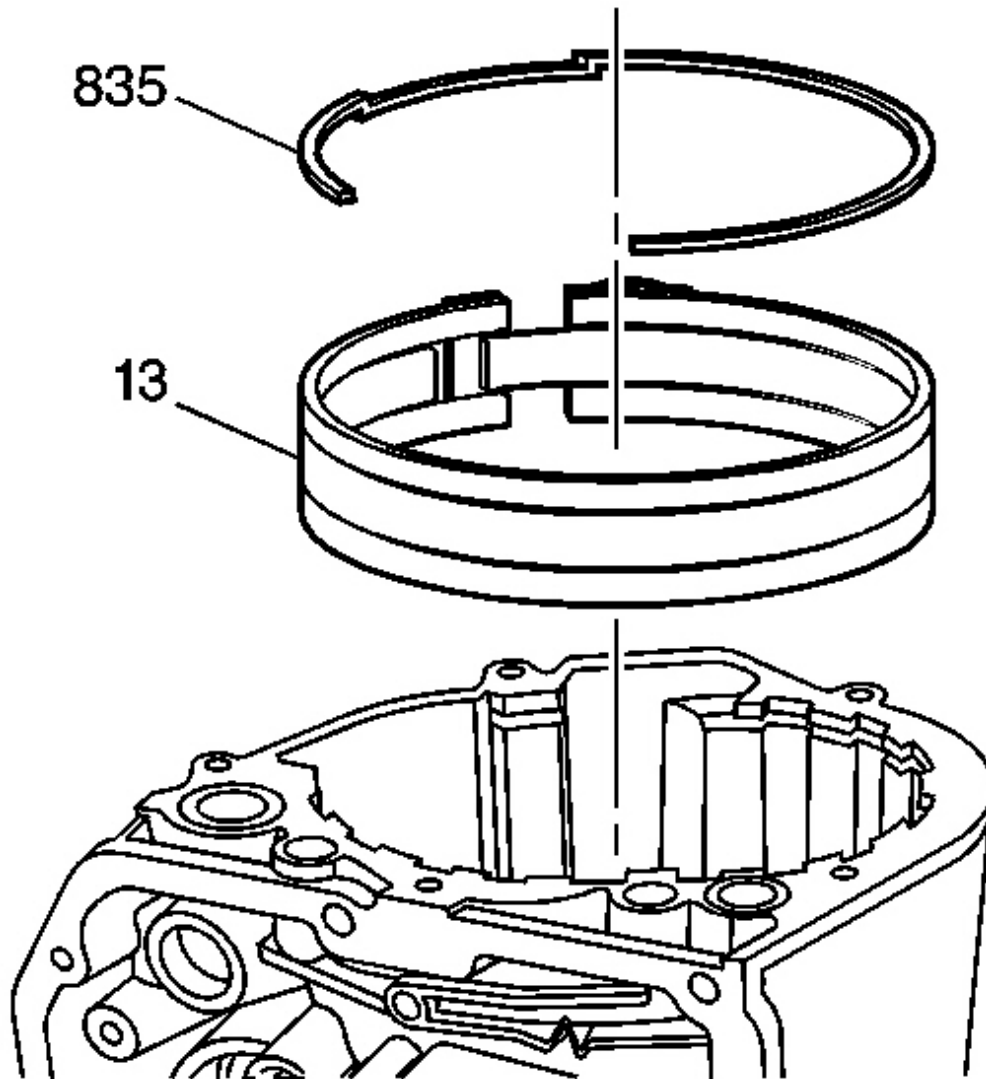


Fig. 59: Locating Fretting Ring
Courtesy of GENERAL MOTORS CORP.

4. Remove the fretting ring (835).
5. Remove the Lo and Reverse band (13).

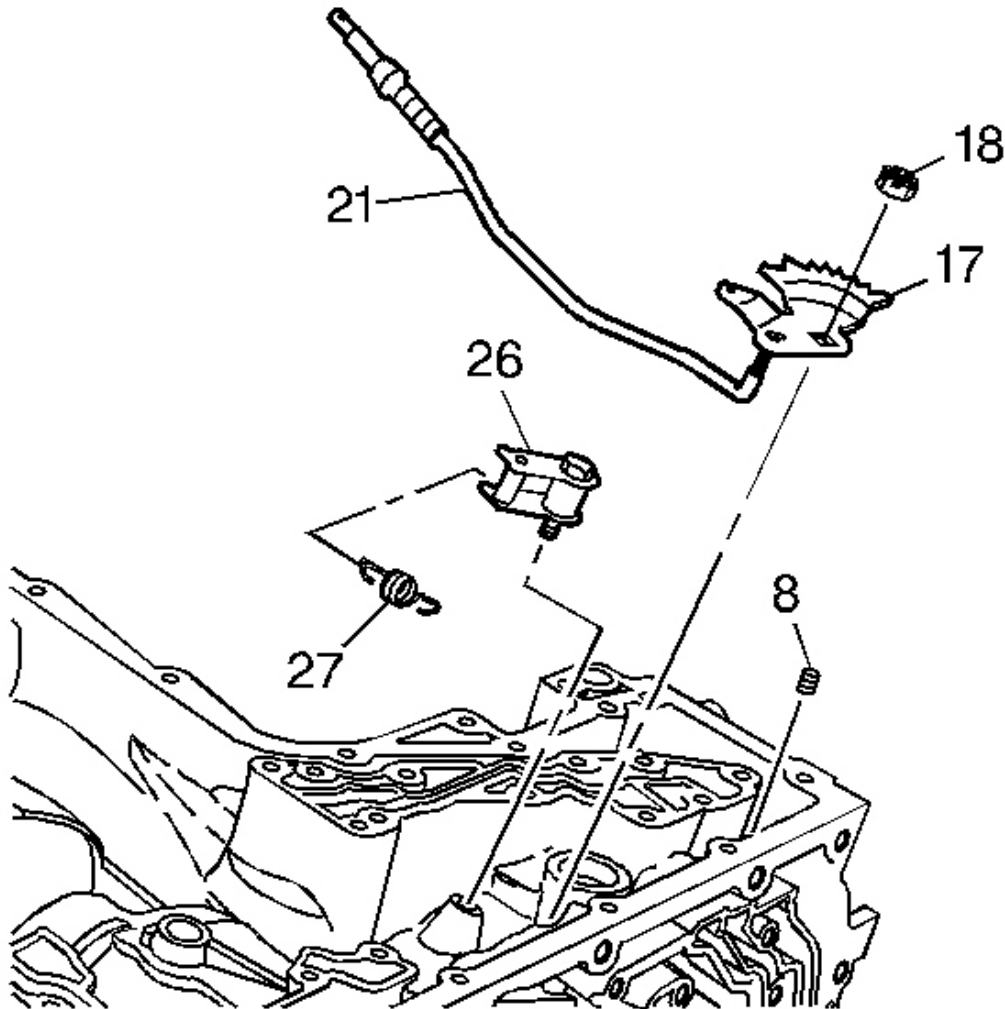


Fig. 60: Locating Detent Lever, Actuator Rod & Manual Shaft Nut
Courtesy of GENERAL MOTORS CORP.

1. Rotate the transmission so the bottom is facing up.
2. Using a pair of pliers, grasp the detent roller end of the detent spring (27). Remove the detent spring (27).
3. Remove the 13 mm detent roller bolt pivot arm, the sleeve, and the washer (26).
4. Remove the 15 mm manual shaft nut (18). You must hold the detent lever (17) in place when removing the manual shaft nut (18) in order to prevent damage to the actuator rod

(21).

5. Remove the detent lever (17) and the actuator rod (21)

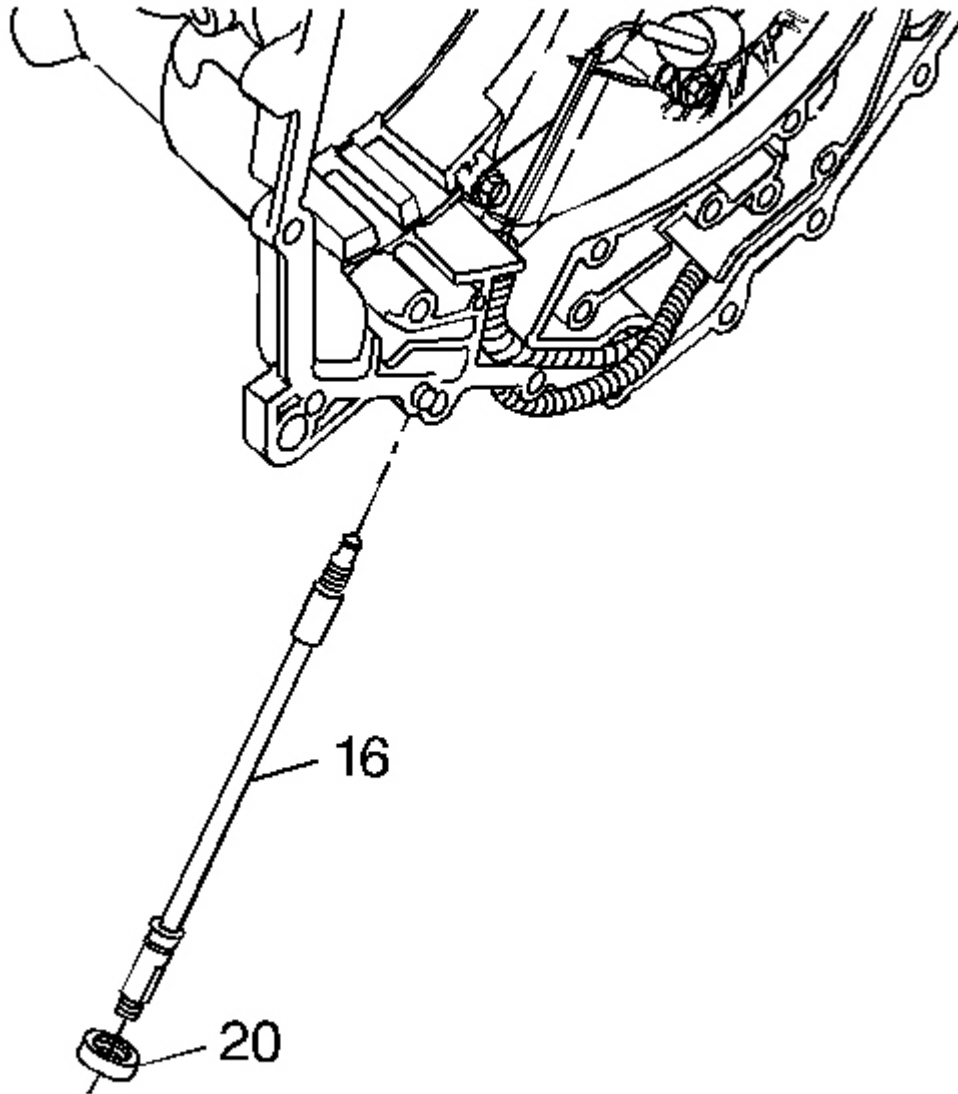


Fig. 61: View of Manual Shaft & Seal
Courtesy of GENERAL MOTORS CORP.

6. Remove the following parts:

- The manual shaft (16) out through the top of the bell housing
- The manual shaft seal (20)

CASE INSPECTION

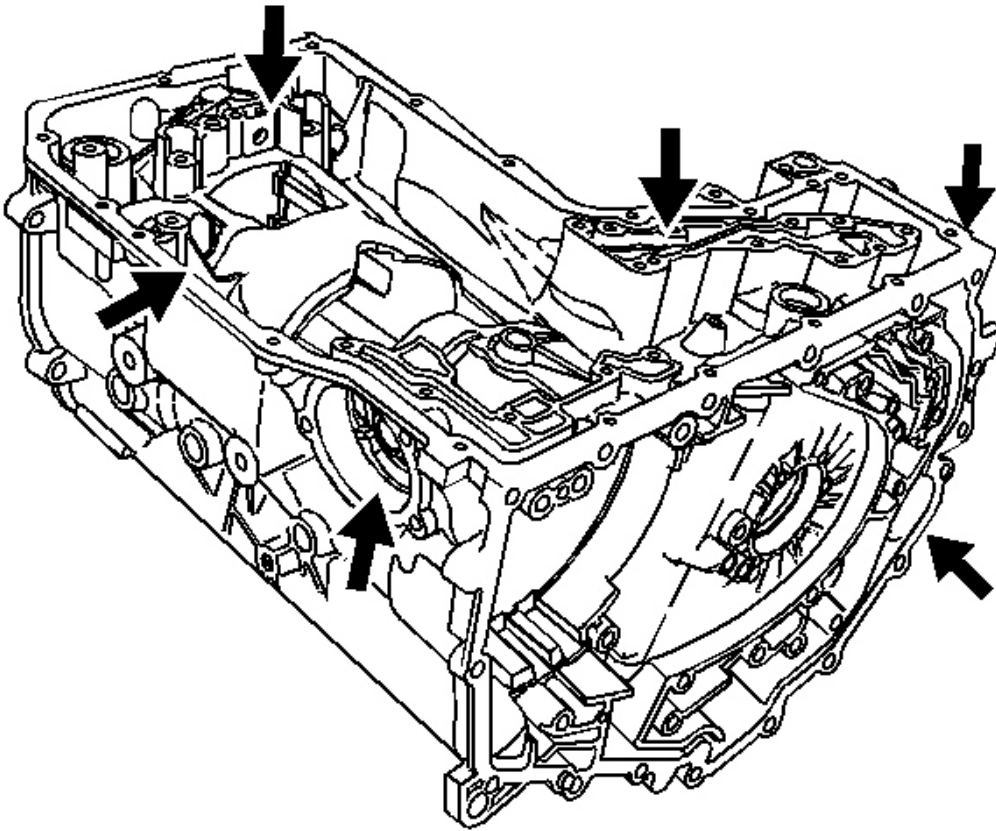


Fig. 62: Identifying Case Inspection Points
Courtesy of GENERAL MOTORS CORP.

NOTE: Use J 36850 or equivalent during assembly in order to retain checkballs or to lubricate components. Lubricants other than the recommended assembly lube changes the transmission fluid characteristics and causes undesirable shift conditions or filter clogging.

2006 Buick Lucerne CXS
2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

1. Clean the case thoroughly with solvent. Air dry.
 - Do not wipe with a cloth or with paper shop towels.
 - Remove all residual sealant. Clean the case threads.
2. Inspect the case channel plate side for the following:
 - Unmarred gasket sealing surfaces that need to be cleaned
 - Bolt holes with stripped threads
 - Porosity between oil passages
 - Cracks in the casting
 - Damaged snap ring grooves
 - Damaged band anchors
 - Leaking drain plugs

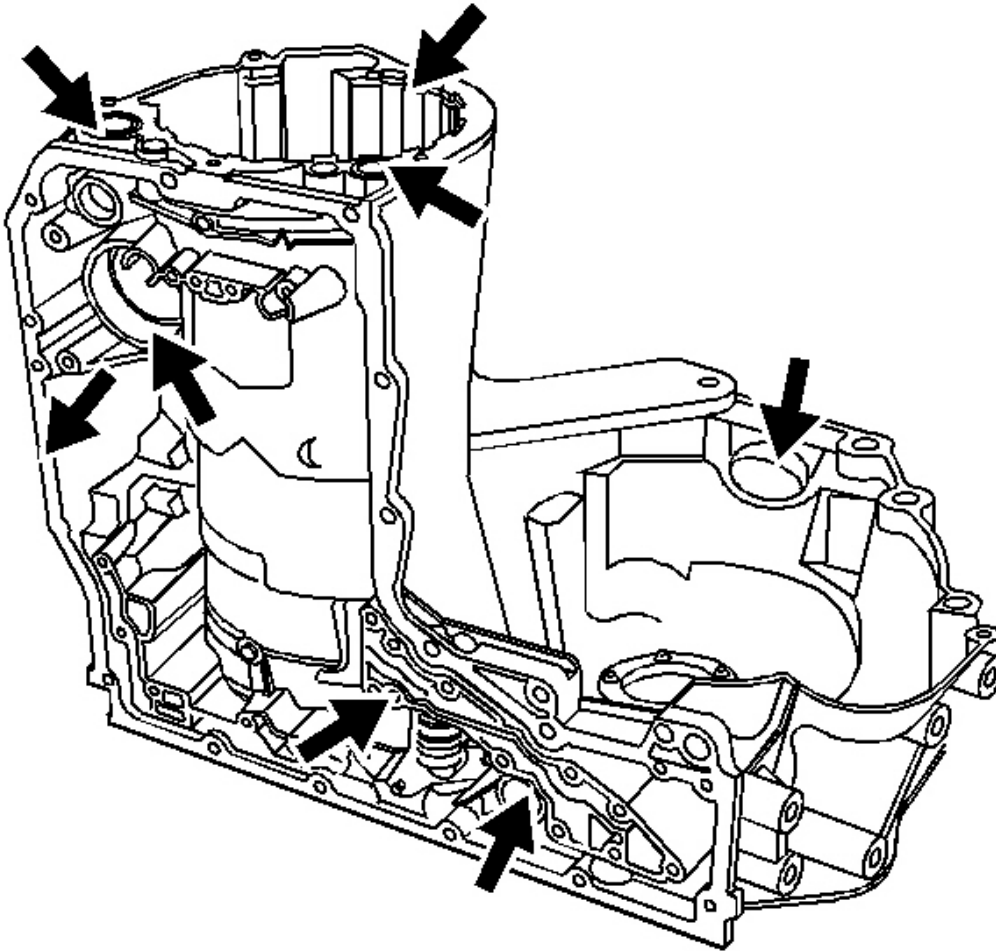


Fig. 63: Identifying Servo Bores Inspection Areas
Courtesy of GENERAL MOTORS CORP.

3. Inspect all servo bores for the following:
 - Scratches or scoring
 - Porosity

DRIVE SPROCKET SUPPORT AND SEAL REPLACEMENT

Tools Required

J 39061 Converter Seal Installer. See **Special Tools**.

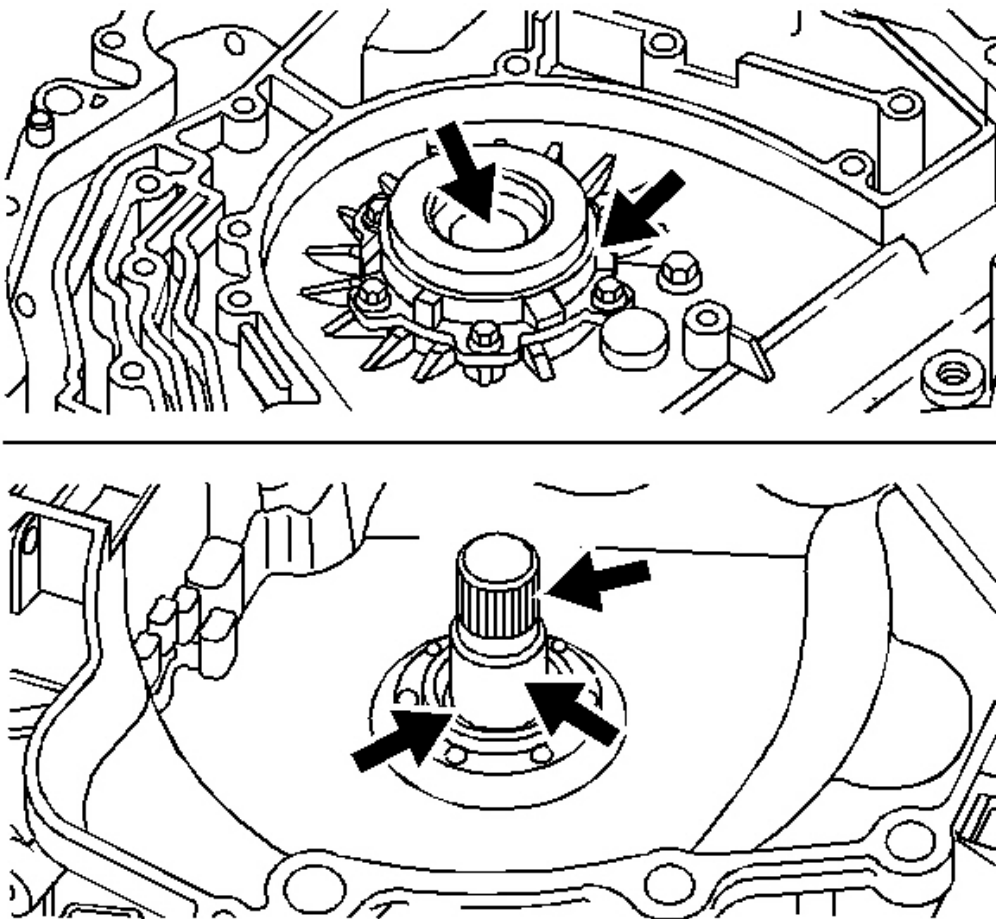


Fig. 64: Locating Inspection Areas Drive Sprocket Support
Courtesy of GENERAL MOTORS CORP.

1. Inspect the drive sprocket support for the following:
 - Spline damage
 - Journal damage
 - Bushing damage
 - Blocked converter drain holes

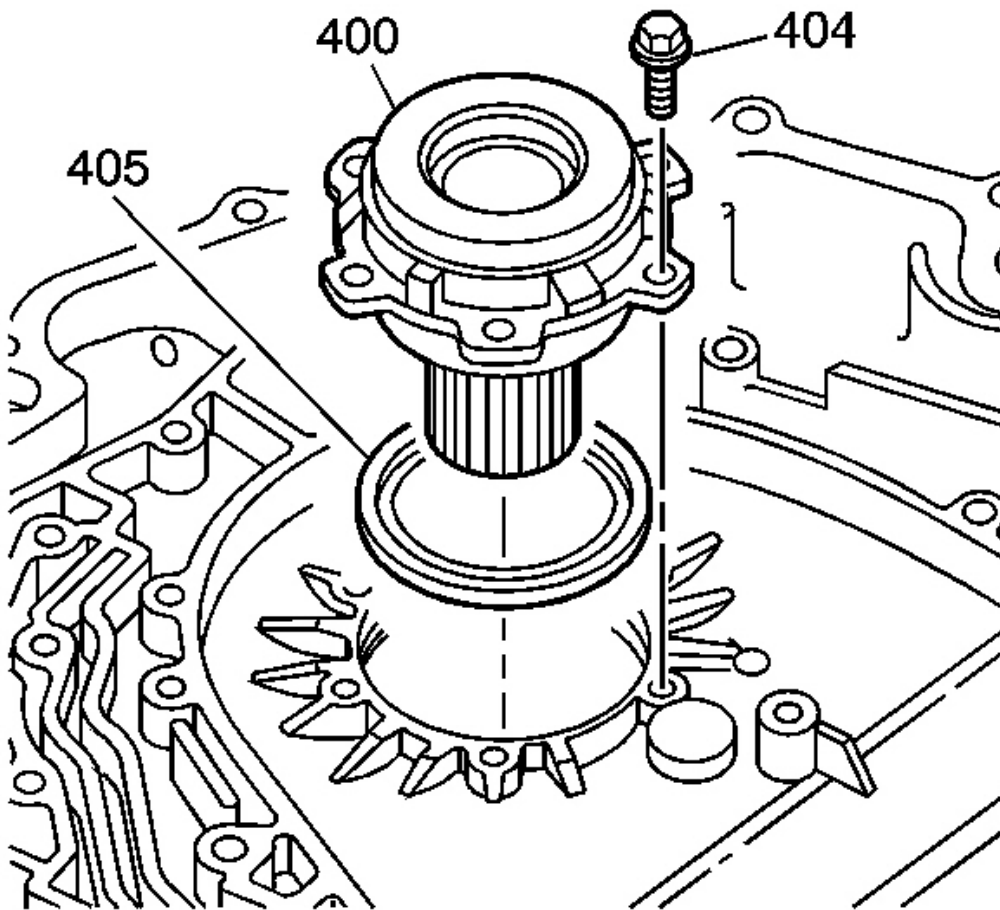


Fig. 65: View Of Drive Sprocket Support & Seal
Courtesy of GENERAL MOTORS CORP.

2. Remove the six 8 mm drive sprocket support bolts (404).
3. Remove the drive sprocket support (400) and the drive sprocket support seal (405).

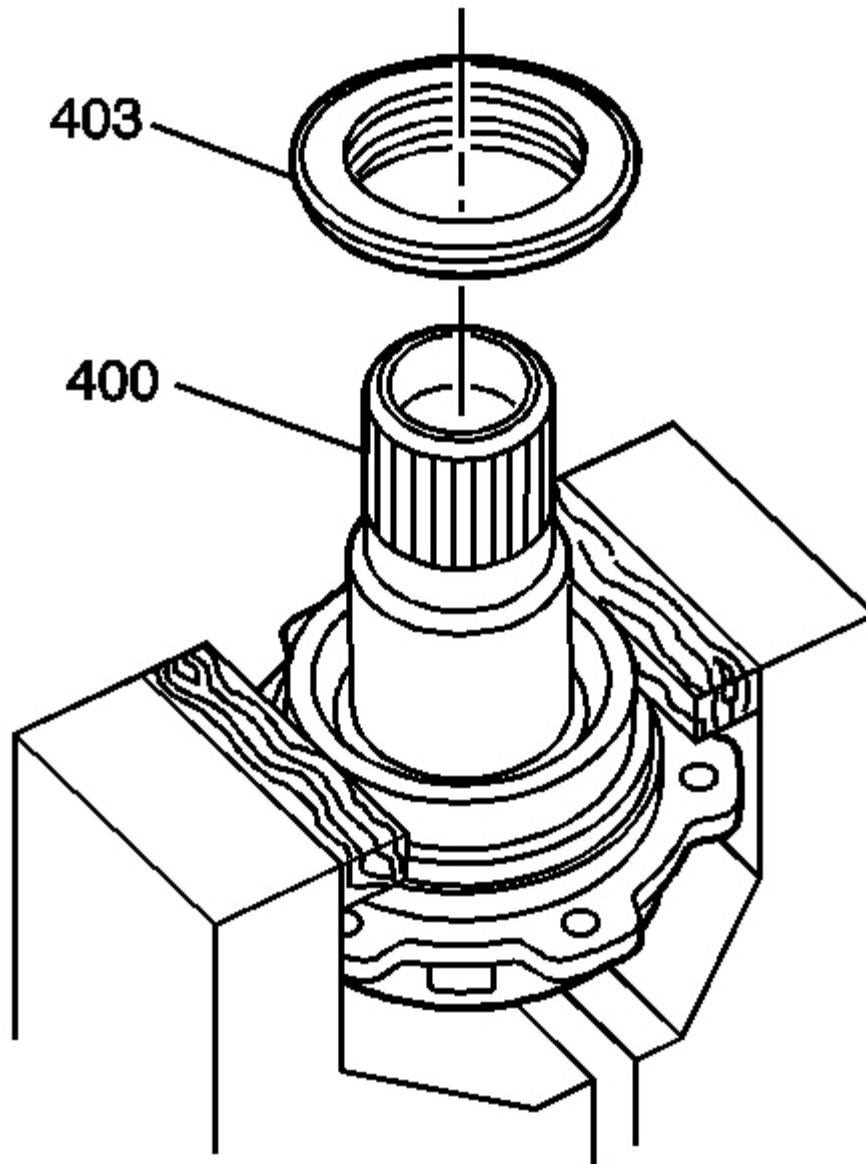


Fig. 66: Removing Converter Helix Seal With Chisel
Courtesy of GENERAL MOTORS CORP.

4. Place the drive sprocket support (400) in a soft jaw vise. Use a wedge-shaped chisel in order to remove the converter helix seal (403).

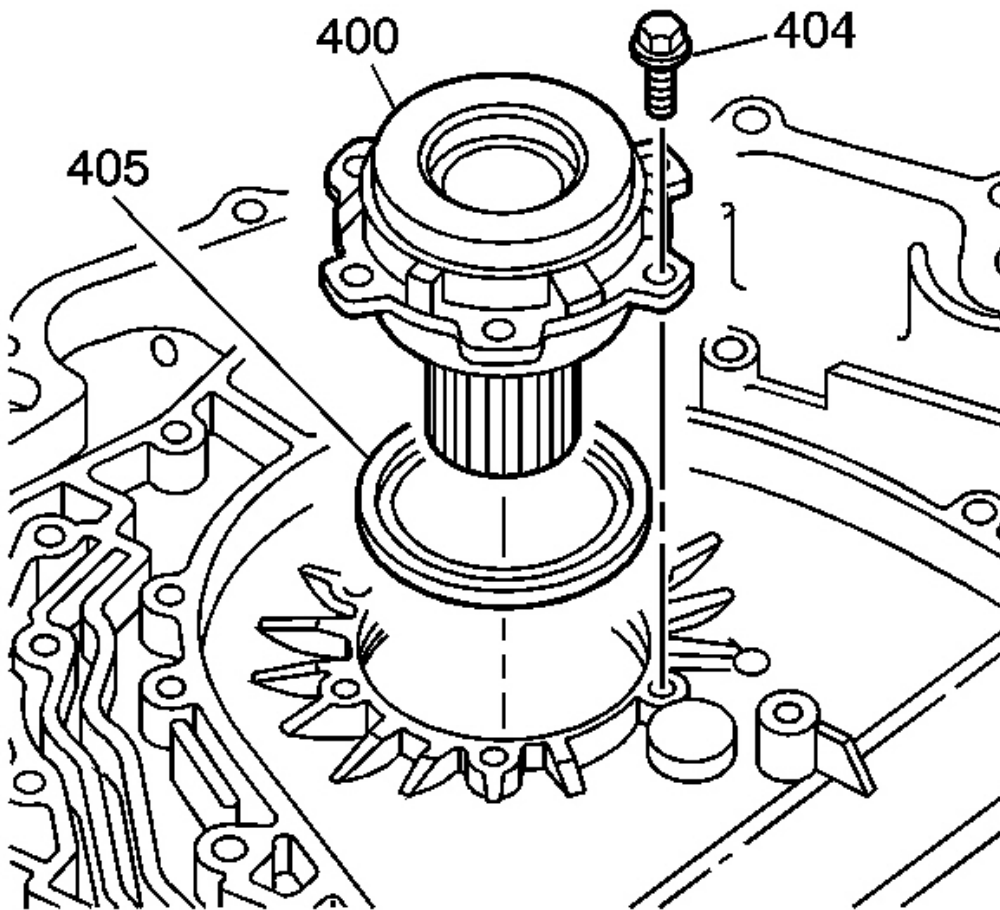


Fig. 67: View Of Drive Sprocket Support & Seal
Courtesy of GENERAL MOTORS CORP.

5. Install a new drive sprocket support seal (405). Install the drive sprocket support (400) into the case.

NOTE: Refer to **FASTENER NOTICE** in Cautions and Notices.

6. Install the six 8 mm bolts (404).

Tighten: Using a star pattern, tighten the bolts to 11-13 N.m (8.0-9.5 lb ft).

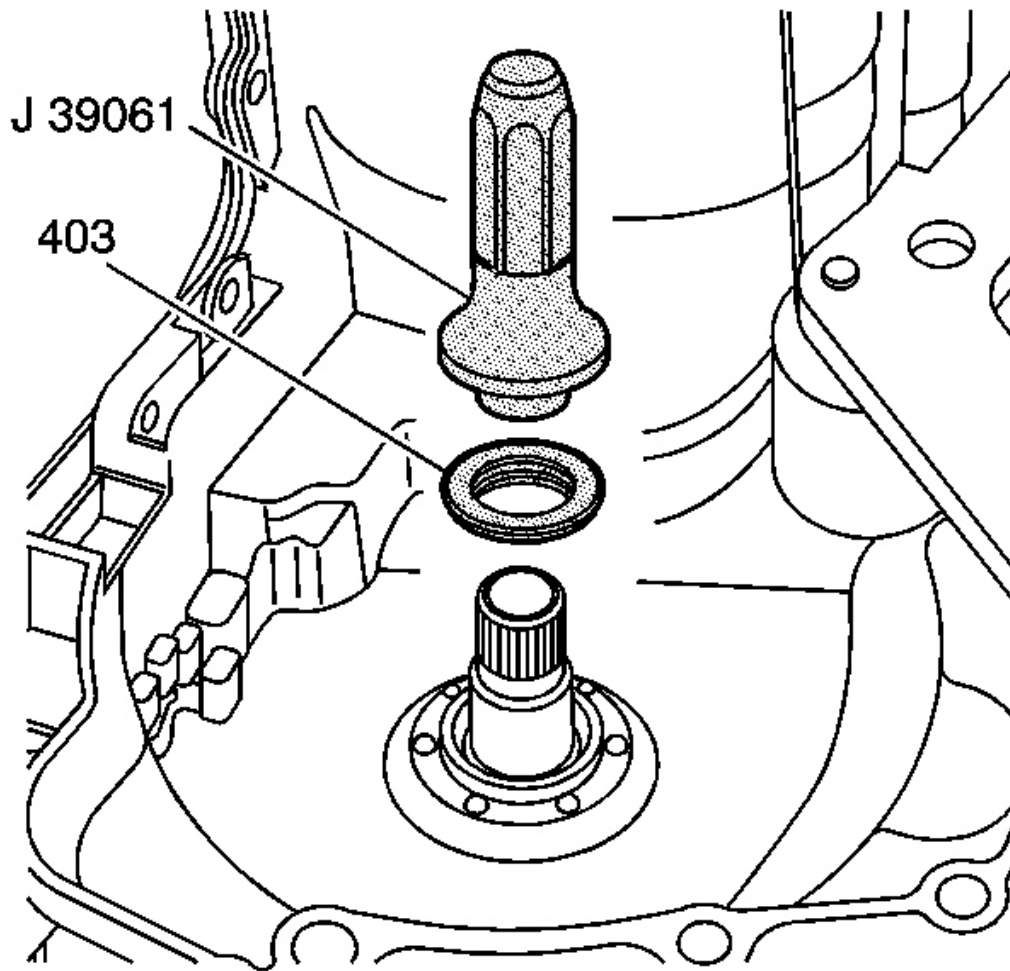


Fig. 68: Installing New Converter Helix Seal Using J 39061
Courtesy of GENERAL MOTORS CORP.

7. Use the **J 39061** in order to install the new converter helix seal (403). See **Special Tools**.

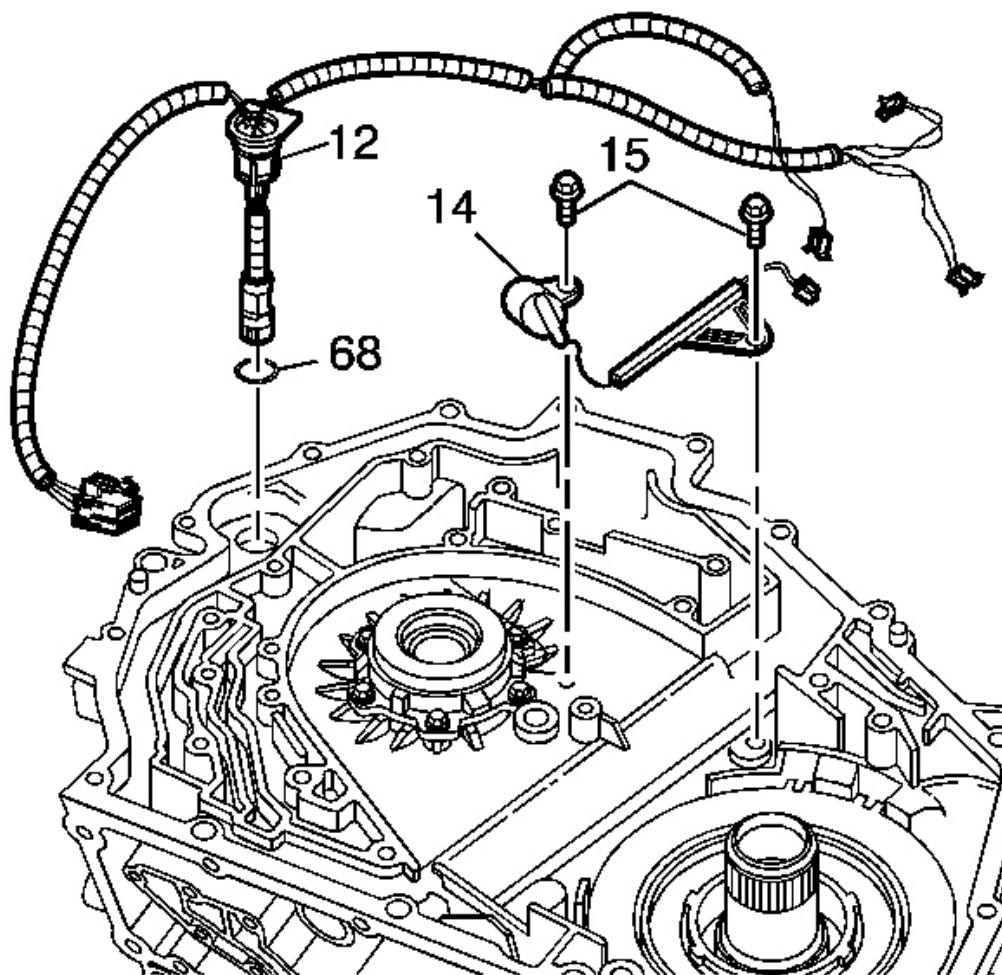


Fig. 69: View Of Automatic Transmission Wiring Harness Assembly Retaining Bolts
Courtesy of GENERAL MOTORS CORP.

8. Inspect the wiring harness (12) for the following:
 - Cut or pinched wires
 - Cut wire insulation
 - Bent or broken connectors
9. Install the wiring harness (12) into the case, with the notch going toward the inside of the case. Make sure that the harness snaps into place at the pass through connector (12). Insert the remainder of the harness into the valleys of the case housing.

10. Install the input speed sensor (14) and its bolt (15).
11. Install the input speed sensor wire harness bracket to the center of the case. Install its bolt (15).

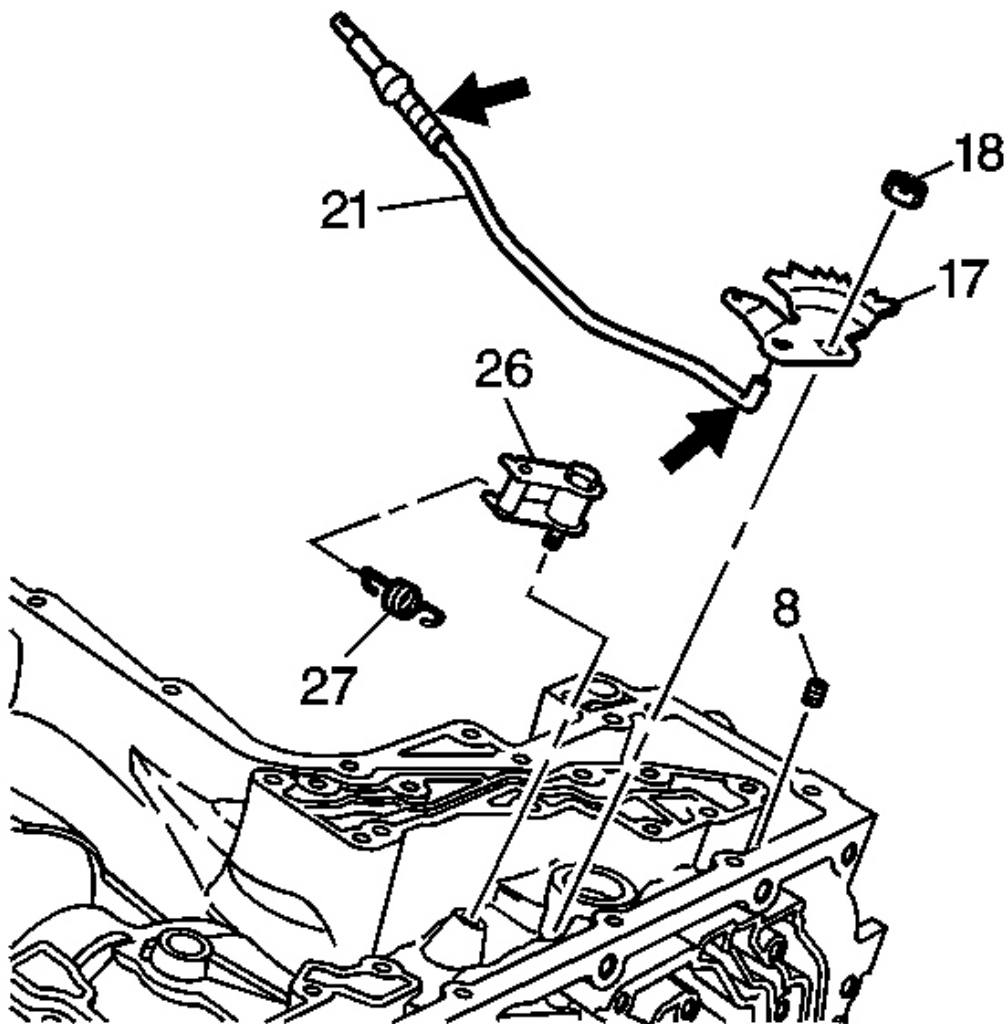


Fig. 70: Inspection Areas On Actuator Rod
Courtesy of GENERAL MOTORS CORP.

12. Inspect the actuator park lock sleeve for excessive wear. Inspect the actuator rod (21) for a cracked end, a bent rod, or a broken spring.

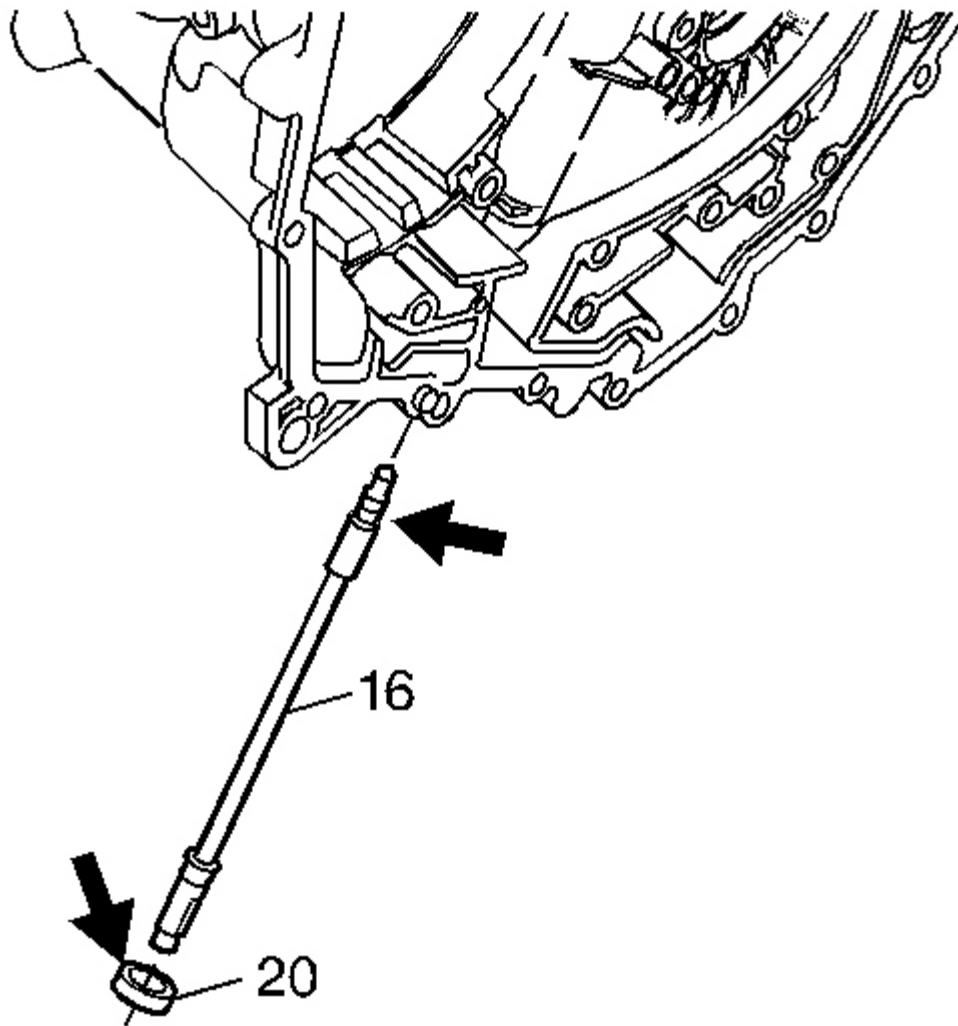


Fig. 71: Locating Inspection Areas Of Manual Shaft
Courtesy of GENERAL MOTORS CORP.

13. Inspect the threads on the manual shaft (16). Inspect the machined area of the manual shaft (16), where the manual shaft seal (20) rides, for nicks and burrs.

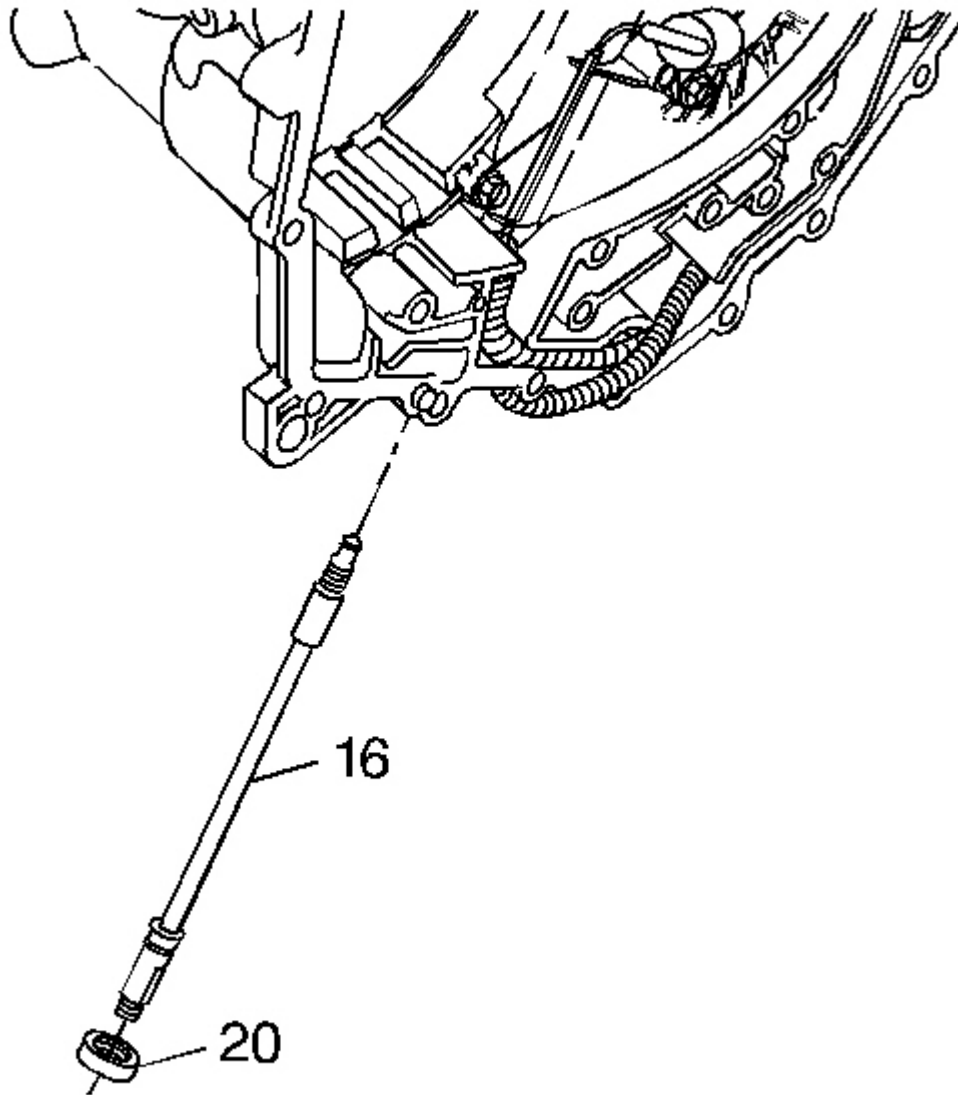


Fig. 72: View of Manual Shaft & Seal
Courtesy of GENERAL MOTORS CORP.

14. Install the new manual shaft seal (20) onto the manual shaft (16).
15. Place the manual shaft (16) through the case.
16. Align the notch on the input speed sensor wire harness bracket to the groove on the manual shaft. Tighten its bolt (15).

17. Seat the manual shaft seal (20) with the appropriate socket.

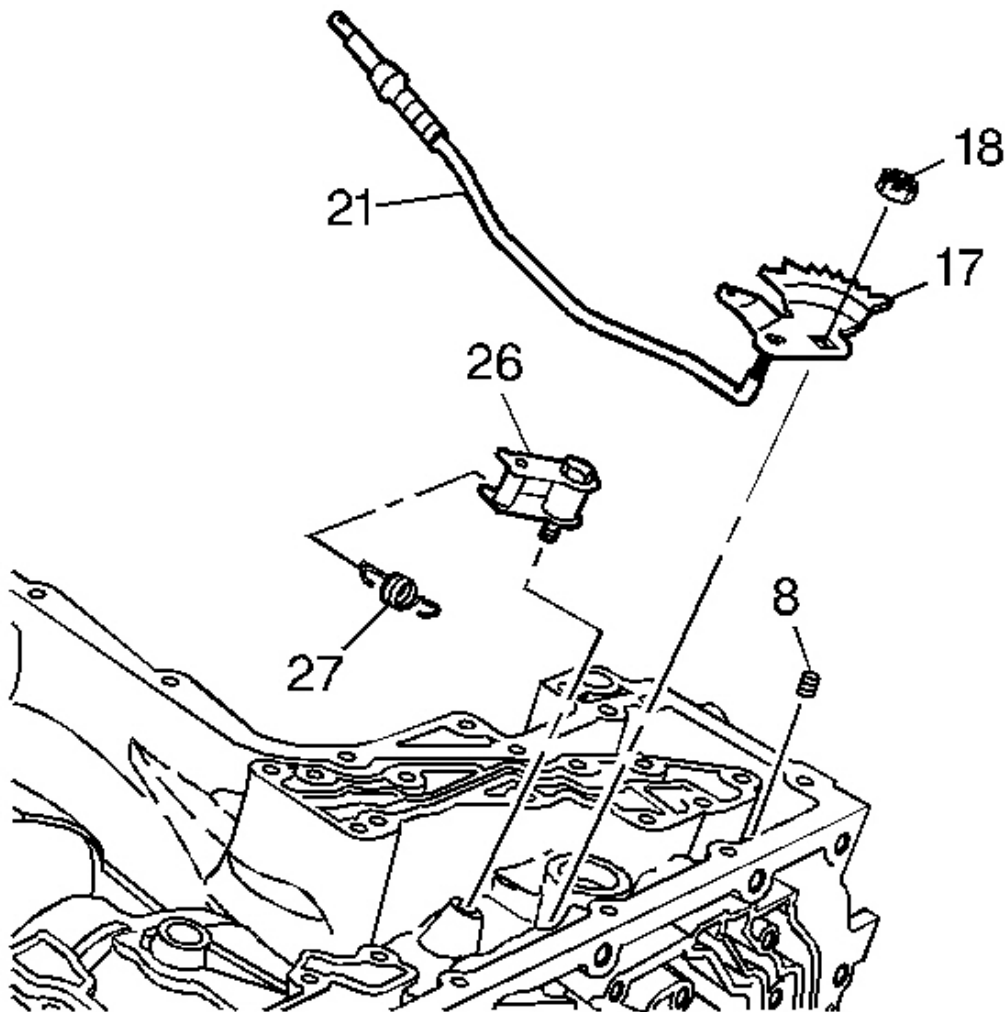


Fig. 73: Locating Detent Lever, Actuator Rod & Manual Shaft Nut
Courtesy of GENERAL MOTORS CORP.

18. Attach the new detent lever (17), the actuator rod (21) and the manual shaft nut (18) to the manual shaft. Hold the detent lever (17) stationary with a screwdriver in order to prevent bending of the actuator rod (21). Slide the actuator rod (21) into the actuator park lock

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

sleeve.

Tighten: Tighten the manual shaft nut to 27-34 N.m (20-25 lb ft).

19. Install the detent roller assembly washer (26), the pivot arm, and the sleeves. Start the pivot bolt by hand.

Tighten: Tighten the pivot bolt to 8-14 N.m (6-10 lb ft).

20. Install the detent return spring (27) to the detent roller assembly (26) and to the manual shaft. Install the spring with the small hook end around of the top of the manual shaft.

FORWARD AND COAST CLUTCH ASSEMBLY OVERHAUL

Tools Required

- **J 39055** Forward Clutch Inner Seal Protector. See **Special Tools**.
- **J 39056** Coast Clutch Seal Protector. See **Special Tools**.
- **J 23327** Clutch Spring Compressor
- **J 28585** Snap Ring Remover

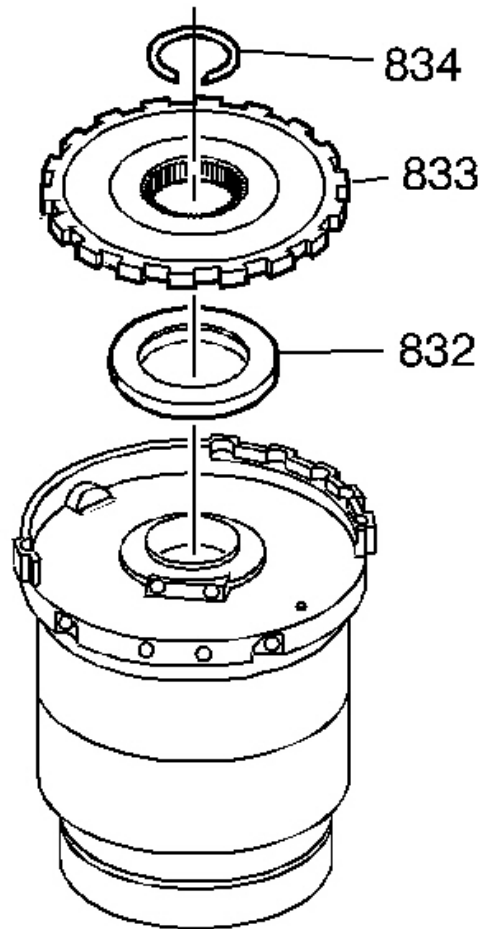


Fig. 74: Parking Lock Gear And The Thrust Bearing And Snap Ring
Courtesy of GENERAL MOTORS CORP.

1. Using the **J 28585** , remove the snap ring (834) from the final drive sun gear shaft.
2. Remove the parking lock gear (833) and the thrust bearing (832).

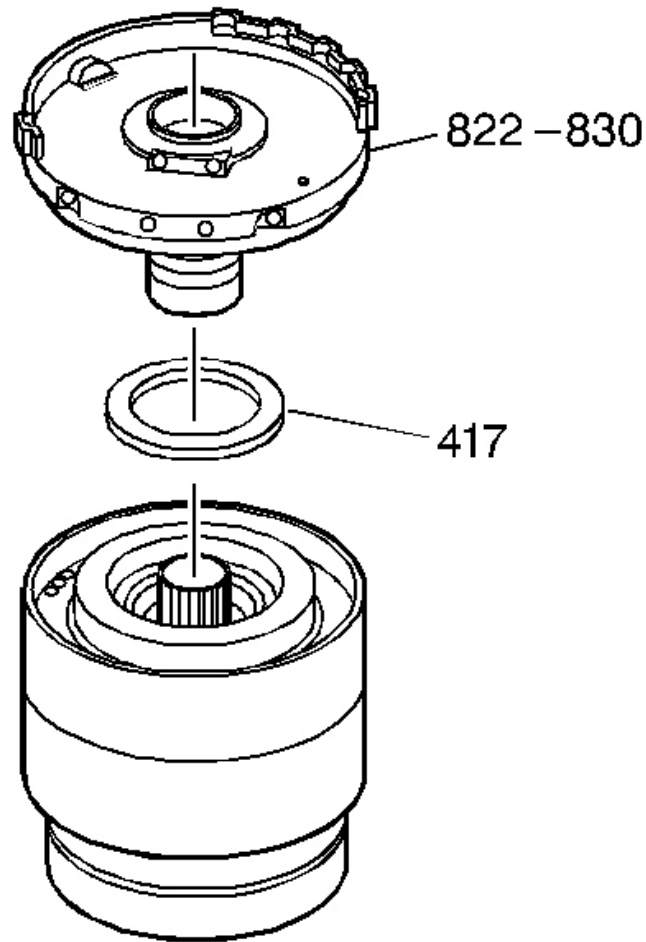


Fig. 75: Locating Low Roller Clutch Assembly, Forward And Coast Clutch Support & Thrust Bearing

Courtesy of GENERAL MOTORS CORP.

3. Remove the forward and coast clutch support with the low roller clutch assembly (822-830).
4. Remove the thrust bearing (417).

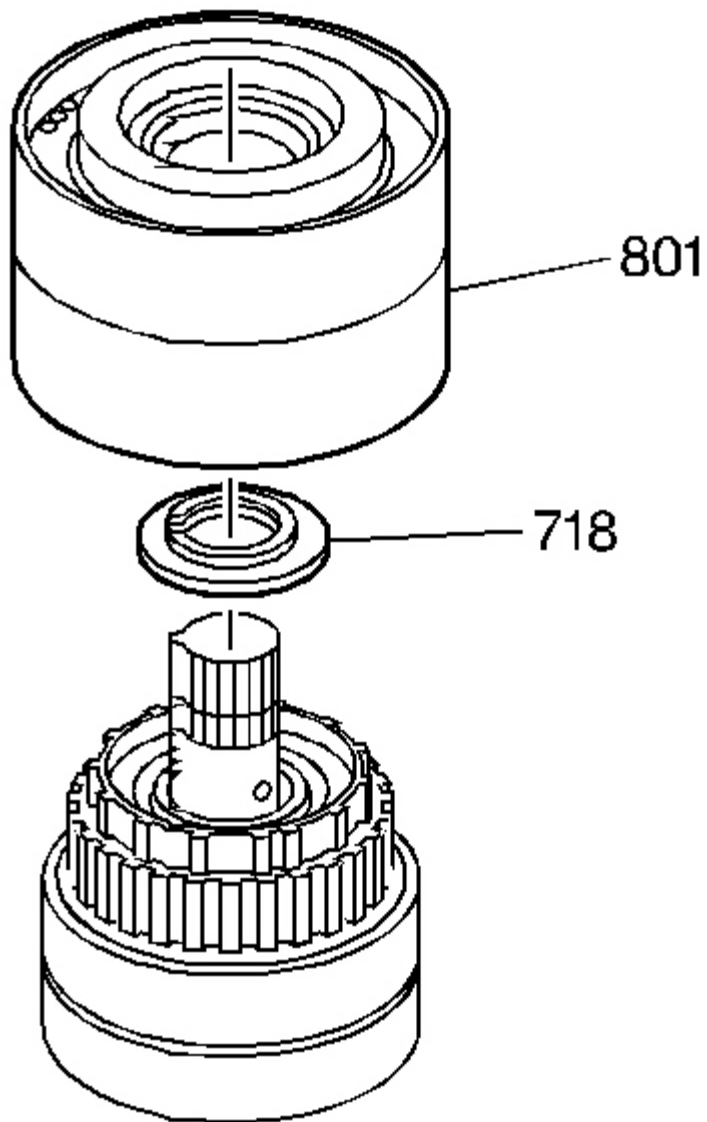


Fig. 76: Removing Forward And Coast Clutch Housing
Courtesy of GENERAL MOTORS CORP.

5. Lift the forward and coast clutch housing (801) off of the coast clutch hub.
6. Remove the thrust bearing (718) from the forward coast clutch housing (801).

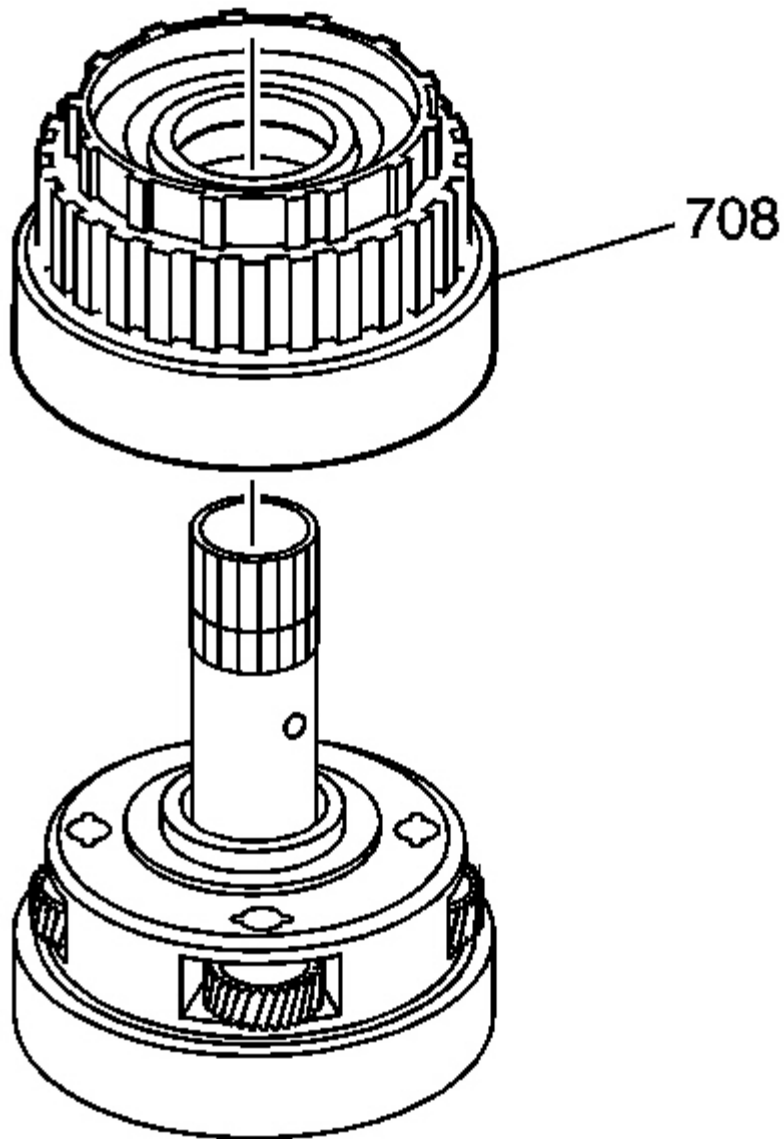


Fig. 77: Separating Input Carrier From Input Internal Gear And Flange
Courtesy of GENERAL MOTORS CORP.

7. Separate the input carrier (708) from the input internal gear and flange.

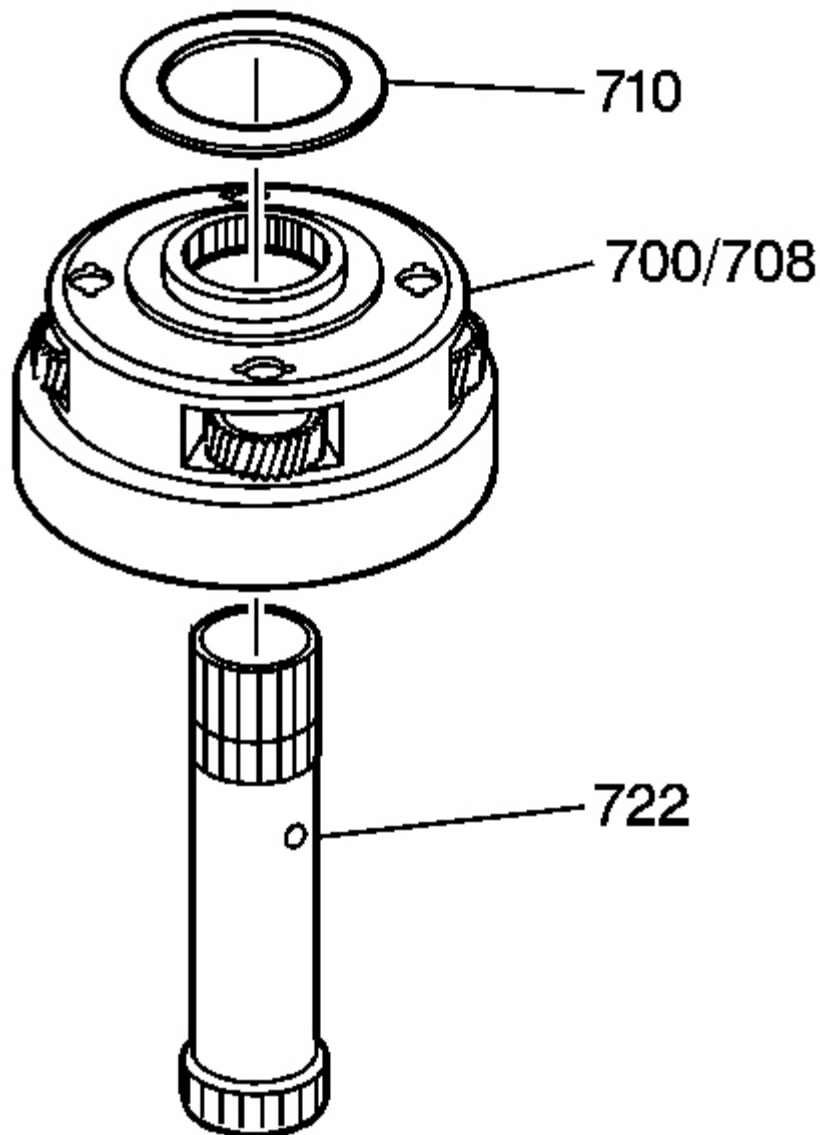


Fig. 78: Removing Input Carrier Assembly & Thrust Bearing
Courtesy of GENERAL MOTORS CORP.

8. Lift the input carrier assembly (700-708) off of the final drive sun gear shaft (722).
9. Remove the thrust bearing (710) from the input carrier assembly (700-708).

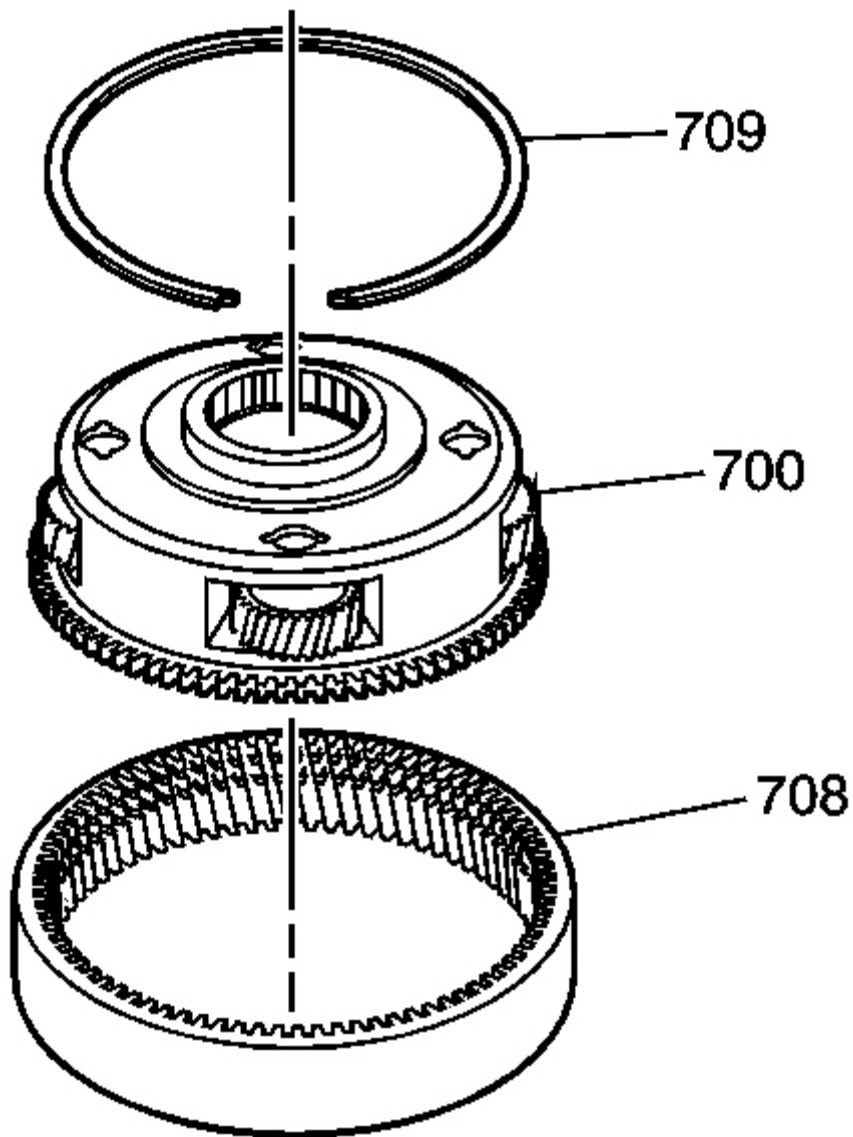


Fig. 79: View Of Input Carrier Assembly, Reaction Internal Gear & Snap Ring
Courtesy of GENERAL MOTORS CORP.

10. Remove the snap ring (709) in order to separate the input carrier (700) from the reaction internal gear (708). The thrust bearing will stay inside of the input carrier (700).

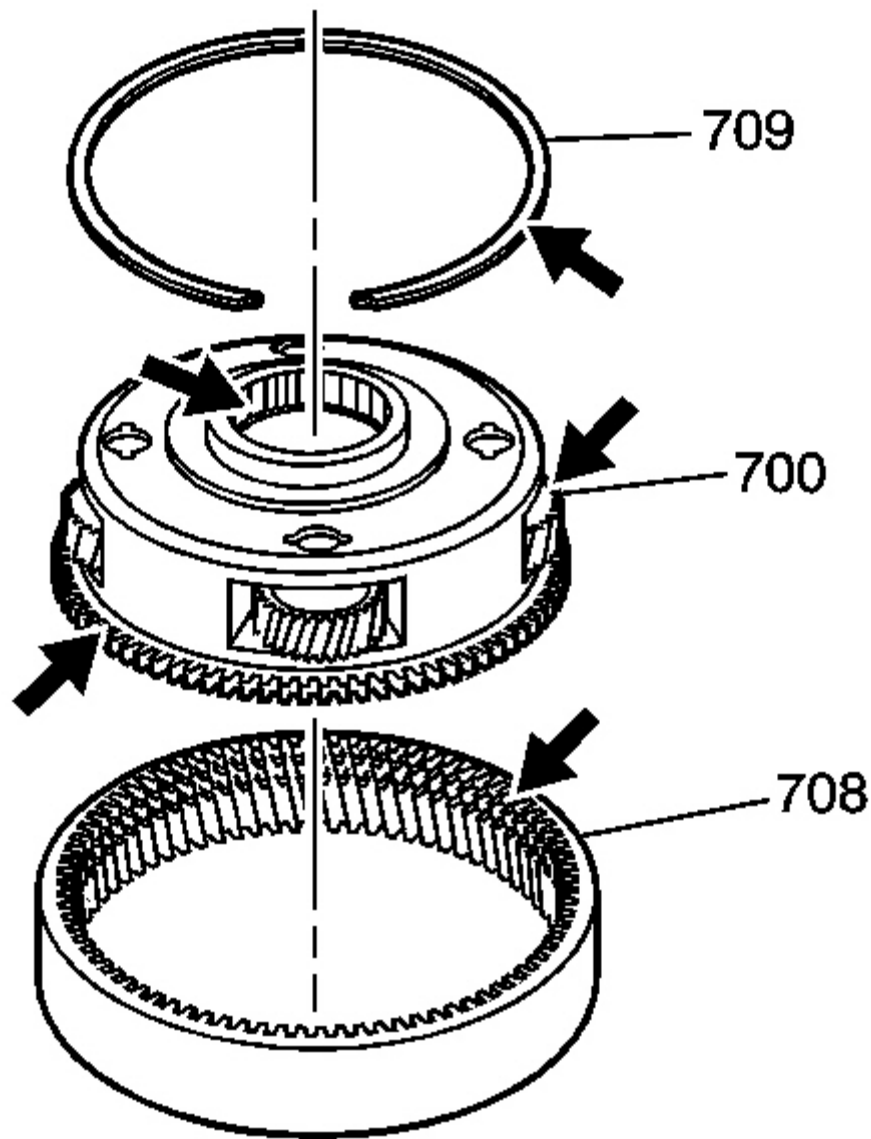


Fig. 80: Inspecting Input Carrier Pinions, Reaction Internal Gear & Snap Ring For Damage

Courtesy of GENERAL MOTORS CORP.

11. Inspect the snap ring (709) for burrs or damage.
12. Inspect the input carrier (700) pinions for nicked or broken teeth.

13. Inspect the input carrier internal gear 708) for broken teeth.

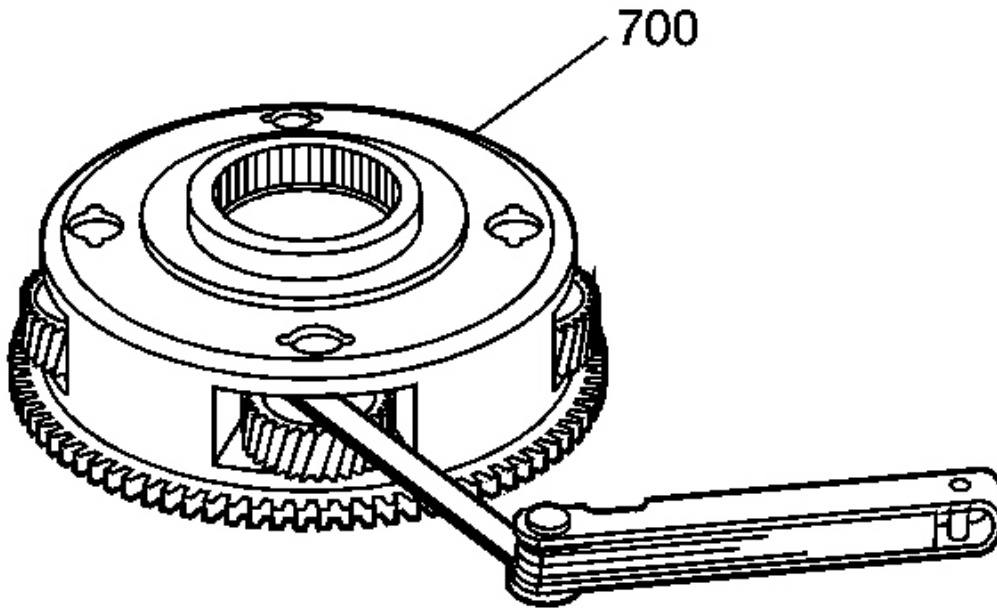


Fig. 81: Measuring Input Carrier End Play With Feeler Gage
Courtesy of GENERAL MOTORS CORP.

14. With a feeler gauge, measure the input carrier (700) end play. The end play should be within a range of 0.09-0.90 mm (0.003-0.035 in).

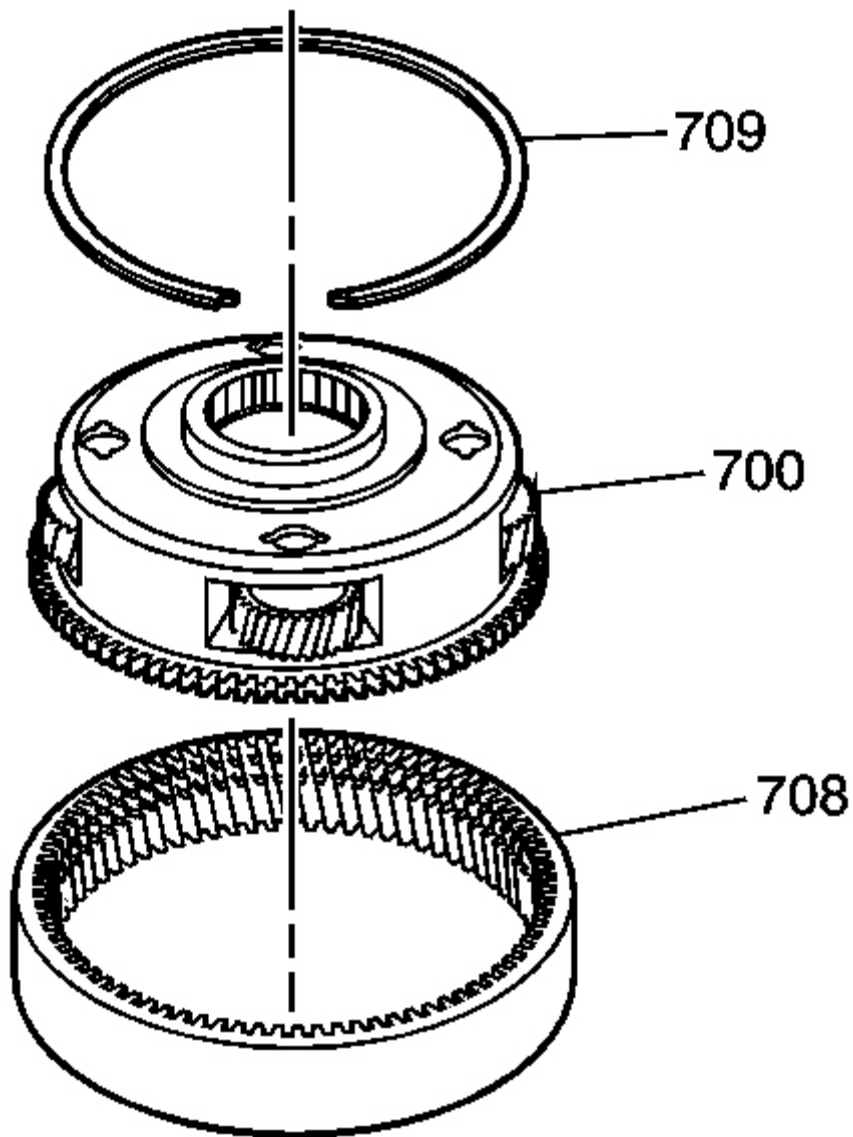


Fig. 82: View Of Input Carrier Assembly, Reaction Internal Gear & Snap Ring
Courtesy of GENERAL MOTORS CORP.

15. Place the input carrier assembly (700) into the reaction internal gear (708).
16. Install the snap ring (709).

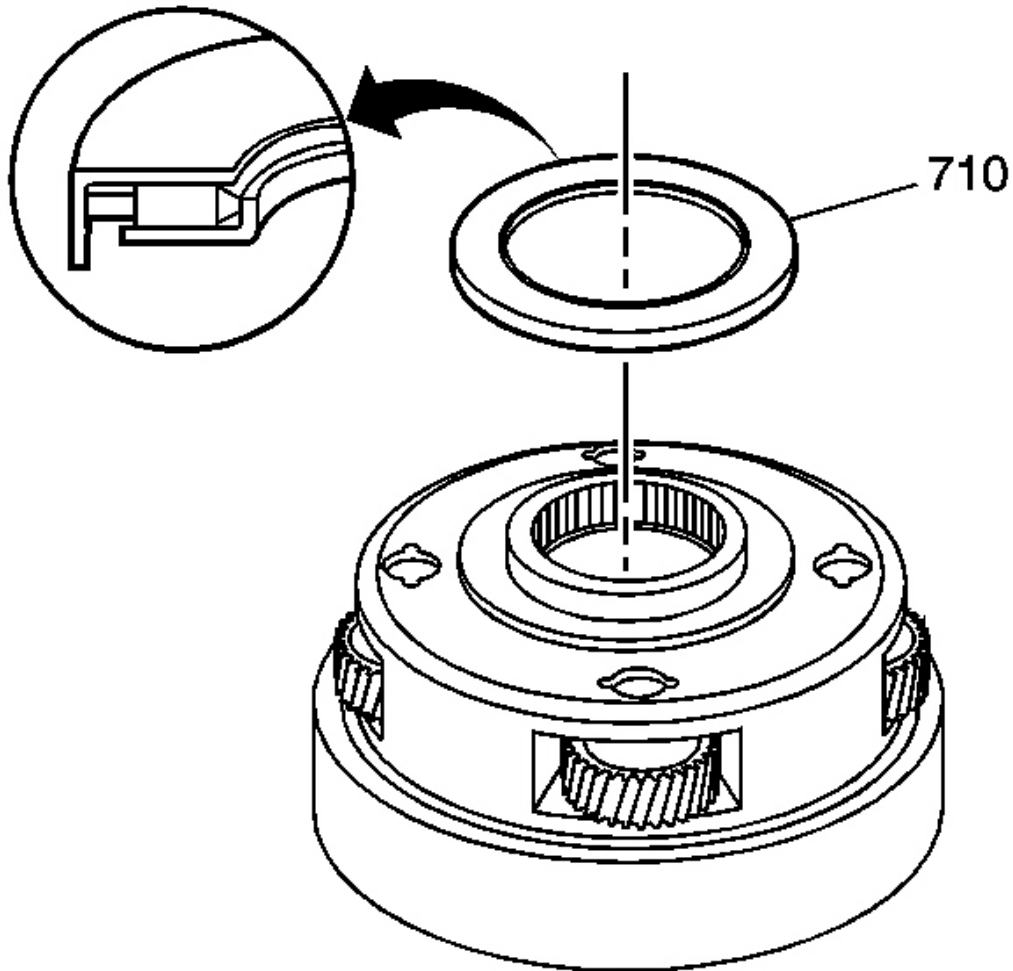


Fig. 83: Installing Input Carrier And Reaction Internal Gear Assembly Thrust Bearing

Courtesy of GENERAL MOTORS CORP.

17. Install the thrust bearing (710) onto the input carrier and reaction internal gear assembly.

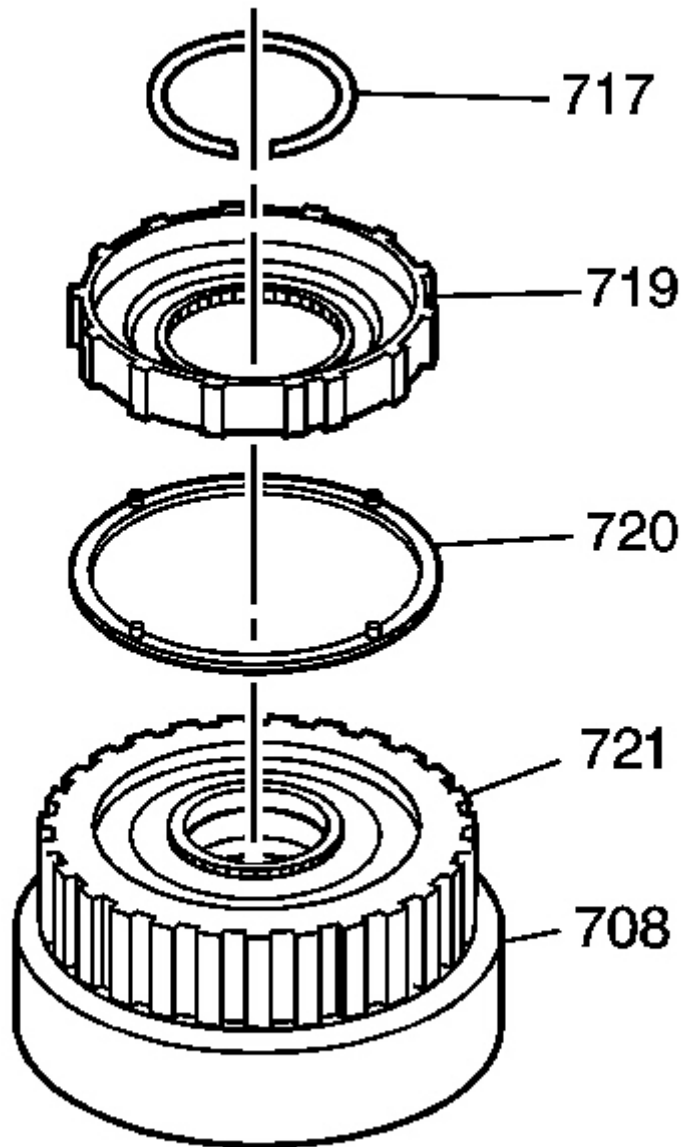


Fig. 84: View Of Thrust Washer On Coast Clutch Hub, Input Internal Gear Flange And Snap Ring

Courtesy of GENERAL MOTORS CORP.

18. Remove the following parts:

- The input internal gear snap ring (717)

- The coast clutch hub (719)
- The thrust washer (720)

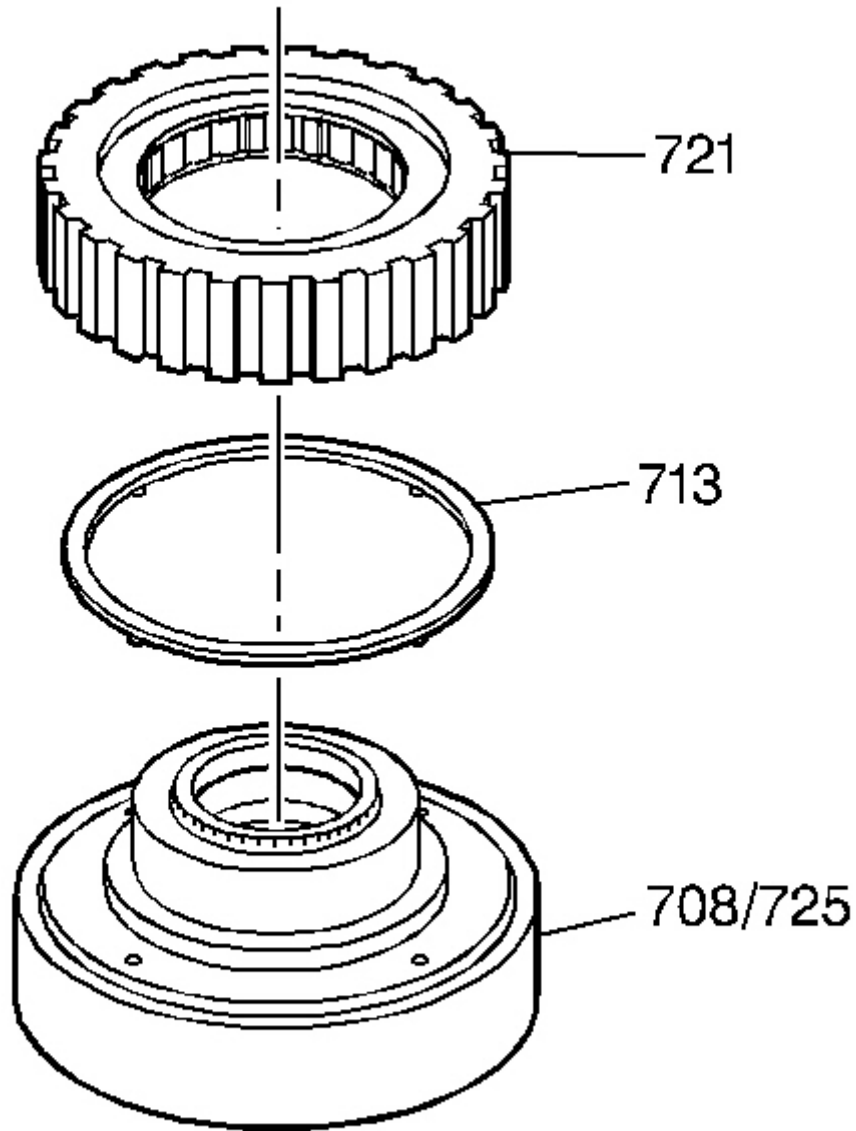


Fig. 85: View Of Forward Sprag, Thrust Washer And Input Internal Gear Flange
Courtesy of GENERAL MOTORS CORP.

19. Remove the forward sprag outer race (721) and forward sprag from the input internal gear flange (708/725). Remove the thrust washer (713).

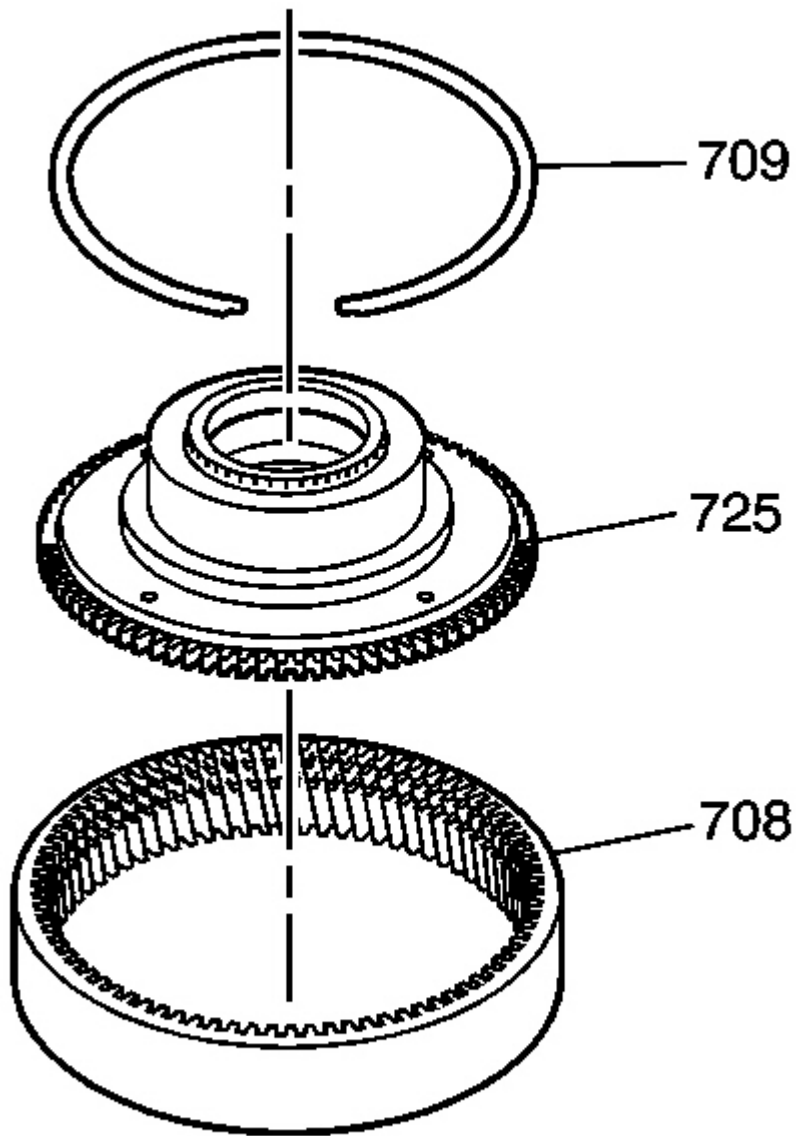


Fig. 86: Locating Input Internal Gear, Snap Ring And Input Internal Gear Flange
Courtesy of GENERAL MOTORS CORP.

20. Remove the snap ring (709) from the input internal gear (708).
21. Lift the input internal gear flange (725) from the input internal gear (708).

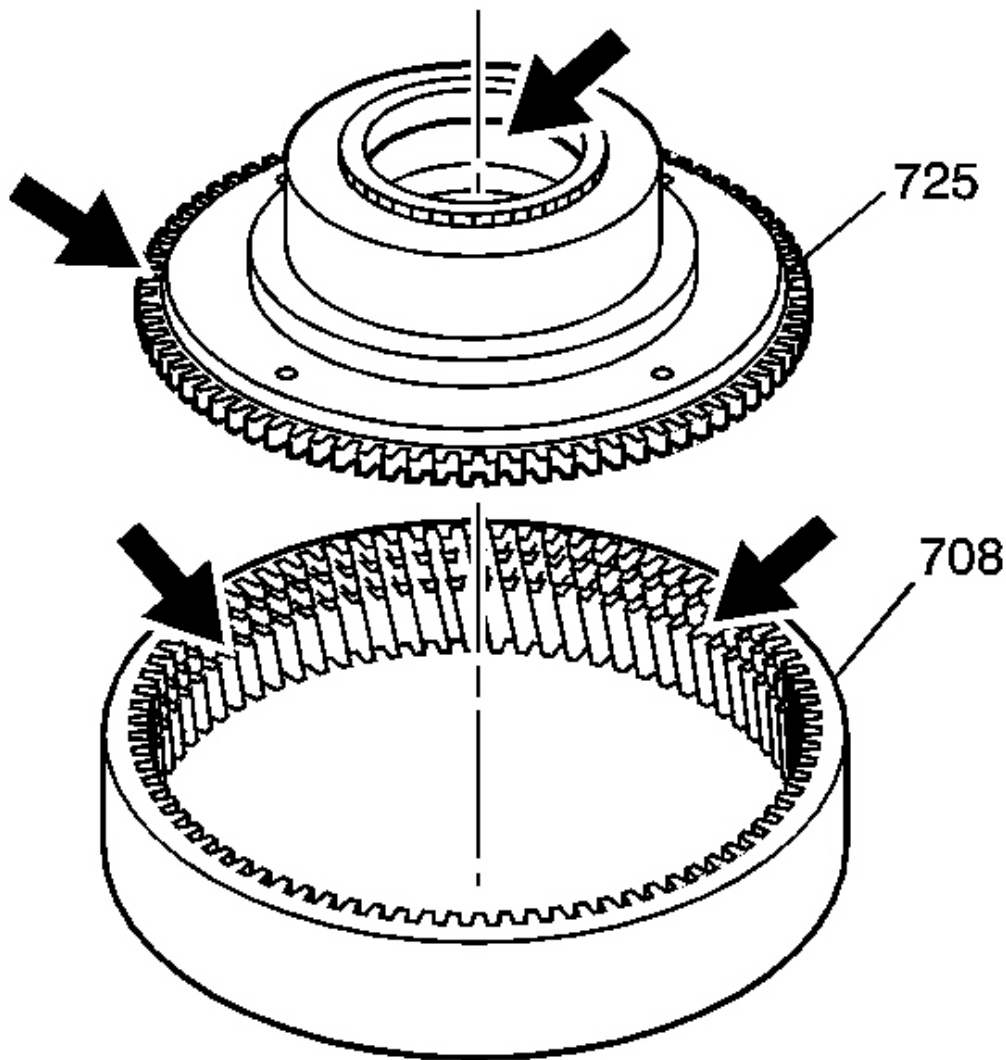


Fig. 87: View Of Input Internal Gear Flange & Bushing Inspection Areas
Courtesy of GENERAL MOTORS CORP.

22. Inspect the input internal gear flange (725) for broken teeth. Inspect the input internal gear flange bushing.

23. Inspect the input internal gear (708) for nicked or broken teeth.

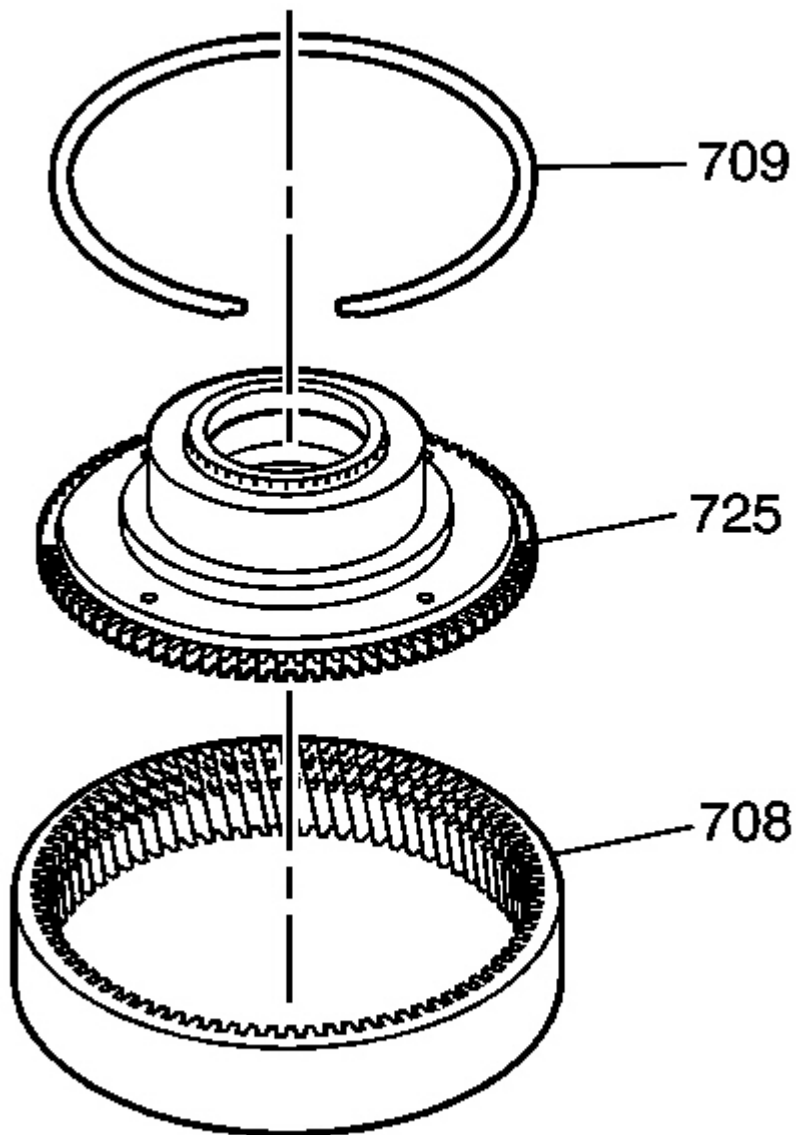


Fig. 88: Locating Input Internal Gear, Snap Ring And Input Internal Gear Flange
Courtesy of GENERAL MOTORS CORP.

24. Install the input internal gear flange (725) into the input internal gear (708).

25. Install the input internal gear snap ring (709).

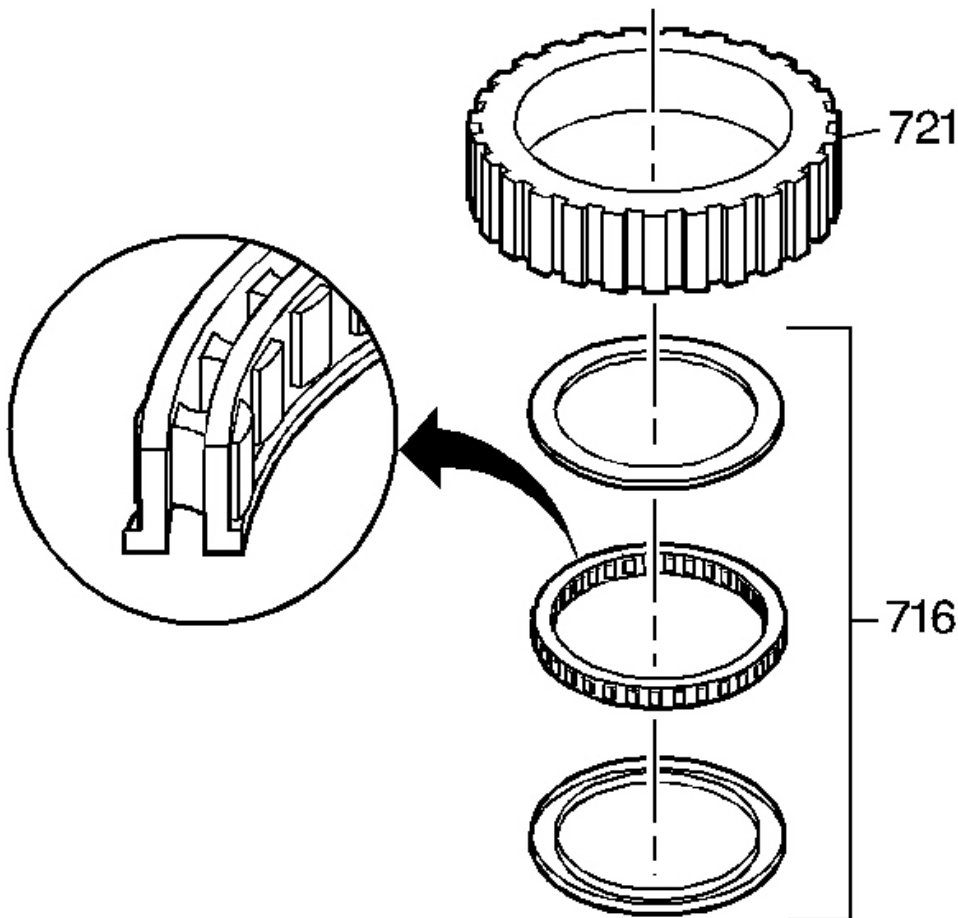


Fig. 89: View Of Forward Sprag Clutch
Courtesy of GENERAL MOTORS CORP.

26. Remove the forward sprag outer race (721).
27. Disassemble the forward sprag clutch (716).
28. Inspect the forward sprag (716) for the following:
- Damage or burrs
 - Damage to the inner side of the race

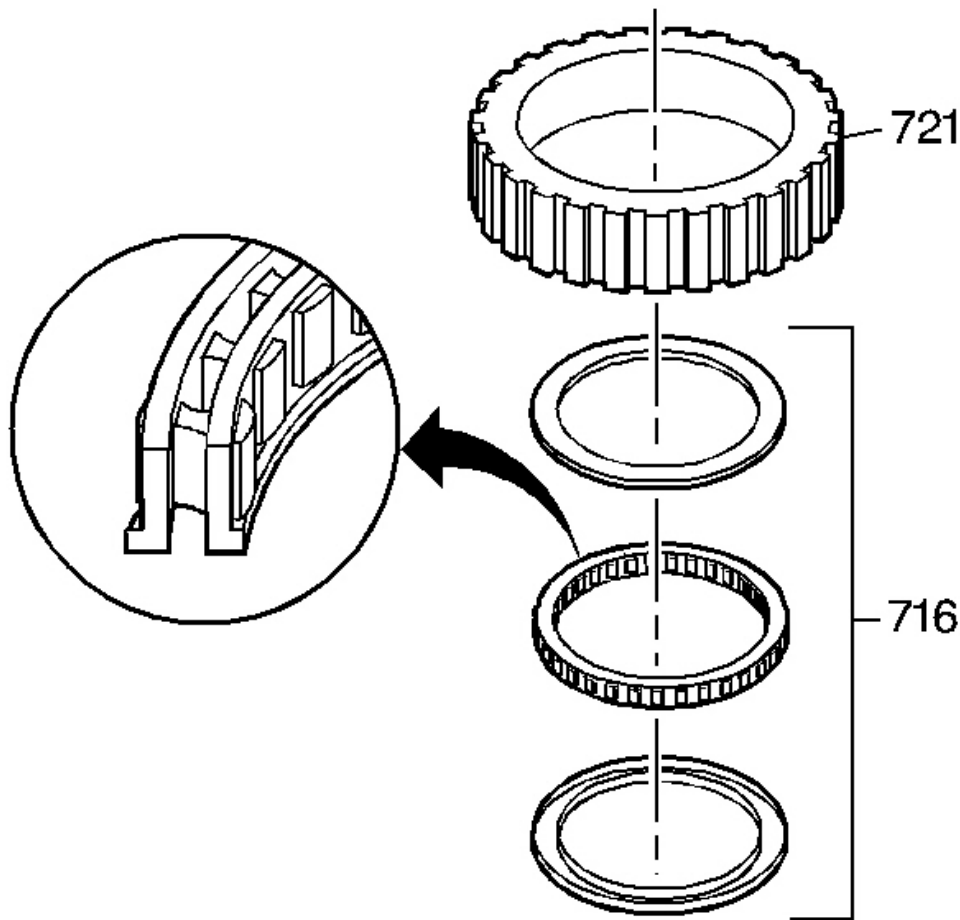


Fig. 90: View Of Forward Sprag Clutch
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Oil feed holes in the forward sprag outer race must face the input internal gear.

IMPORTANT: The lip on the forward sprag cage must face the input internal gear.

29. Assemble the forward sprag clutch (716).
30. Install the forward sprag clutch (716) into the forward sprag outer race (721).

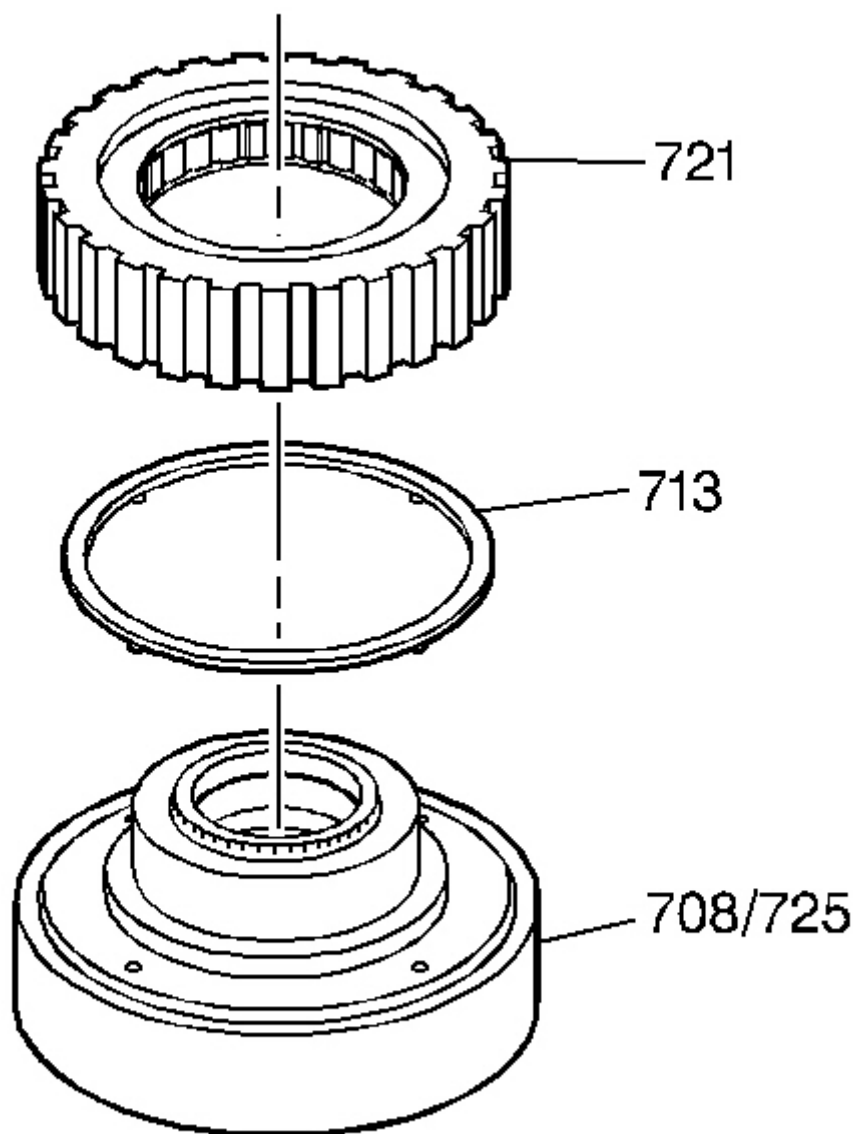


Fig. 91: View Of Forward Sprag, Thrust Washer And Input Internal Gear Flange
Courtesy of GENERAL MOTORS CORP.

31. Install the thrust washer (713) onto the input internal gear flange (708/725).
32. Install the forward sprag and outer race (721) onto the input internal gear flange (708/725).

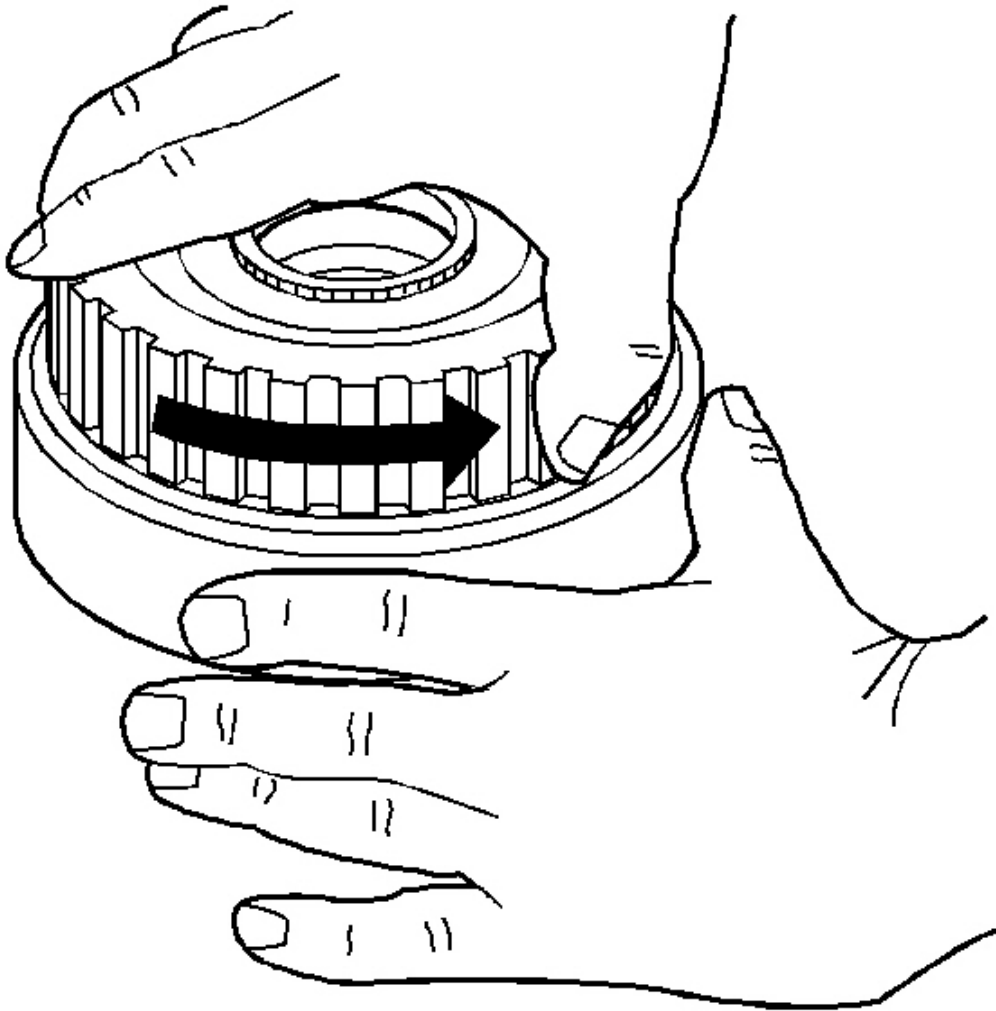


Fig. 92: Checking Forward Sprag Rotation
Courtesy of GENERAL MOTORS CORP.

33. Check that the forward sprag rotation freewheels in a counterclockwise direction.

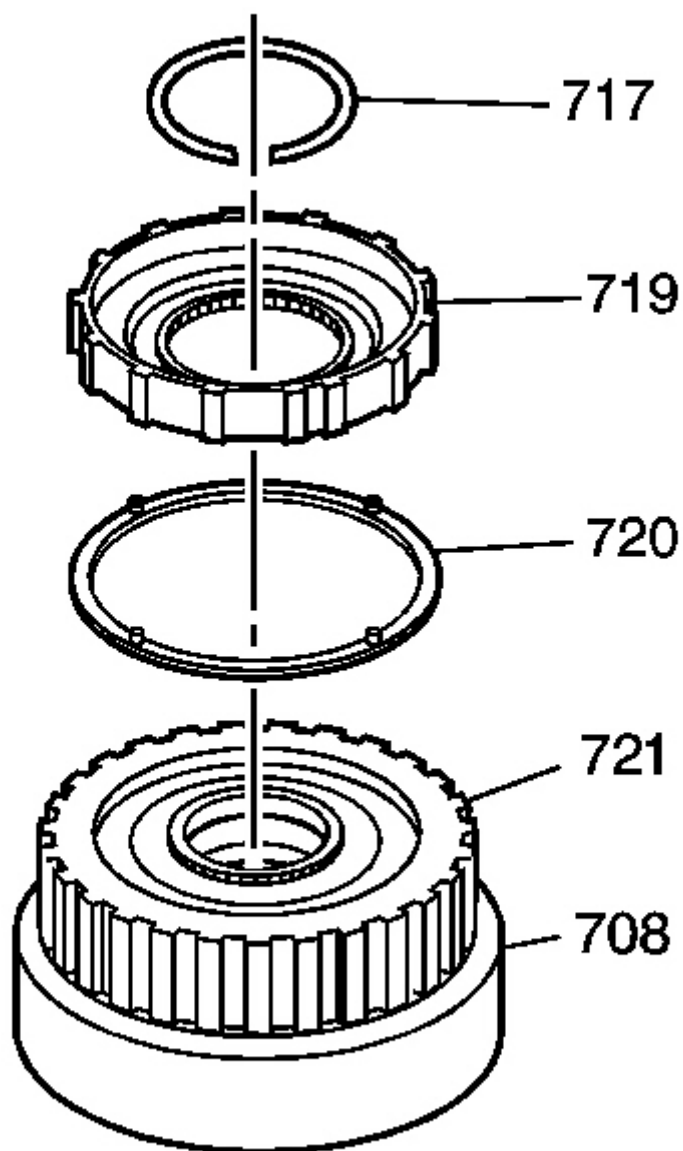


Fig. 93: View Of Thrust Washer On Coast Clutch Hub, Input Internal Gear Flange And Snap Ring
Courtesy of GENERAL MOTORS CORP.

34. Install the thrust washer (720) onto the coast clutch hub (719).
35. Install the coast clutch hub (719) onto the input internal gear flange (708).

36. Install the snap ring (717) onto the input internal gear flange (708).

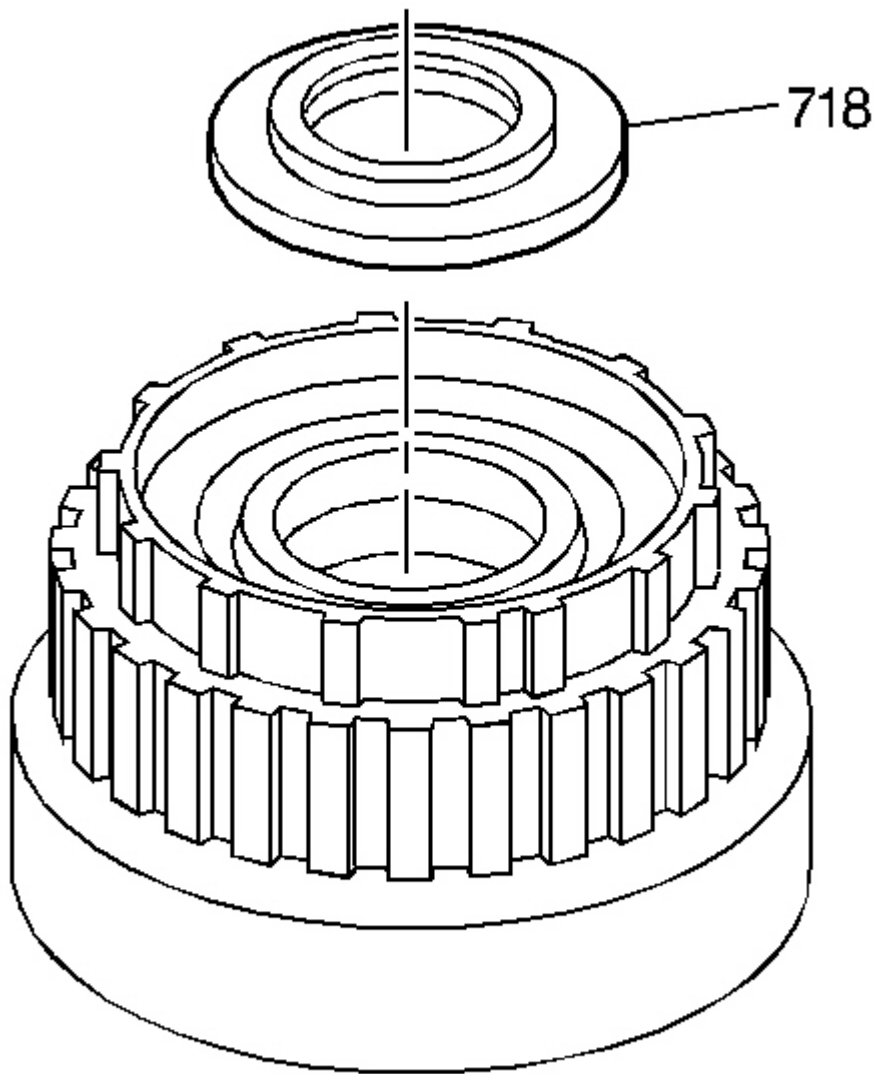


Fig. 94: Installing Thrust Bearing On Coast Clutch Hub
Courtesy of GENERAL MOTORS CORP.

37. Install the thrust bearing (718) onto the coast clutch hub.

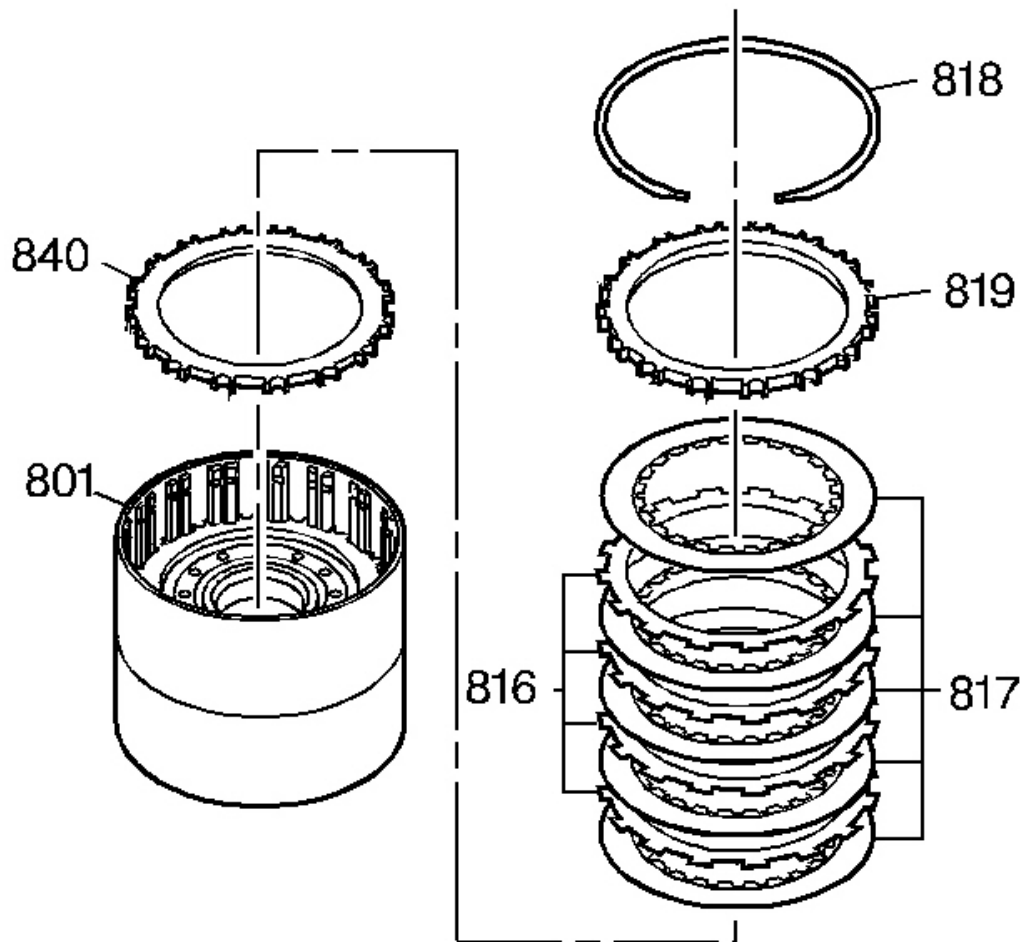


Fig. 95: Identifying Forward Clutch Plates
 Courtesy of GENERAL MOTORS CORP.

38. Remove the forward and coast clutch housing snap ring (818).
39. Remove the forward and coast clutch backing plate (819), and all of the forward clutch fiber (817) and steel (816) plates. Remove the apply plate (840).

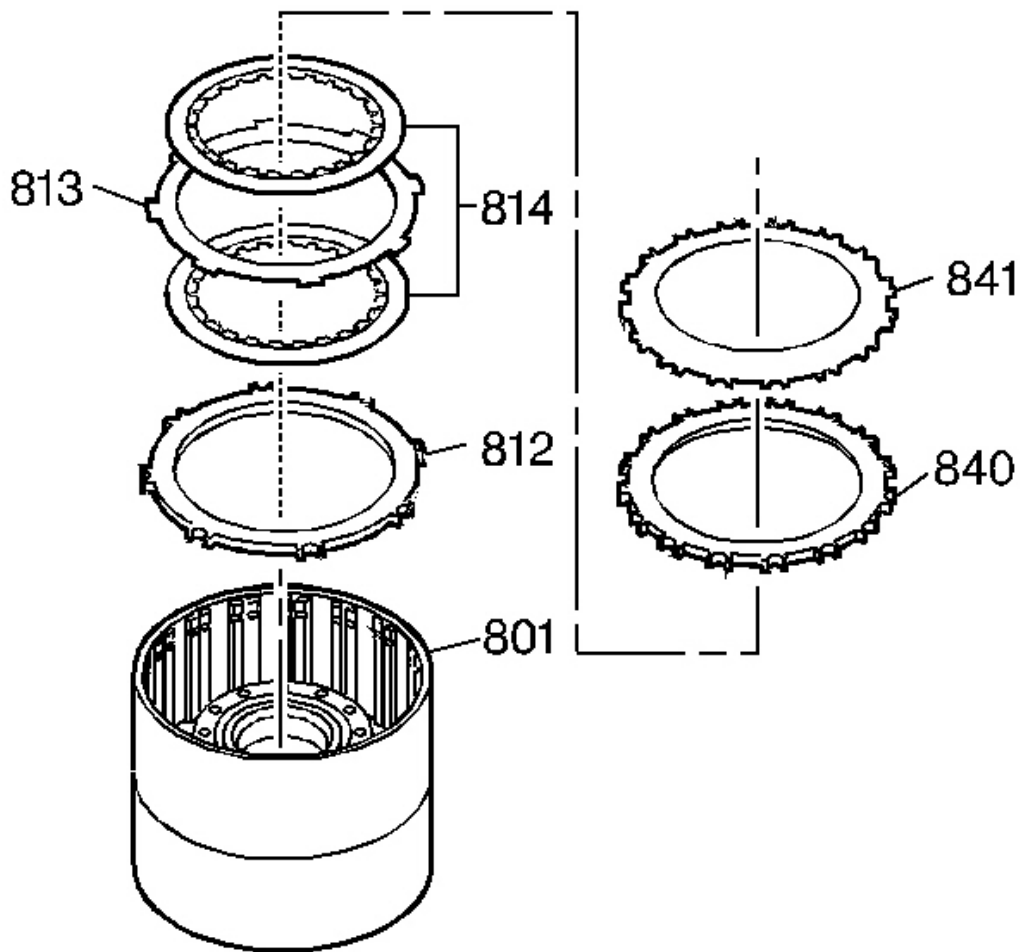


Fig. 96: Locating Coast Clutch Plates
Courtesy of GENERAL MOTORS CORP.

40. Remove the forward and coast clutch belleville plate (841) and backing plate (840).
41. Remove the coast clutch fiber (814) and steel (813) plates. Remove the apply plate (812).

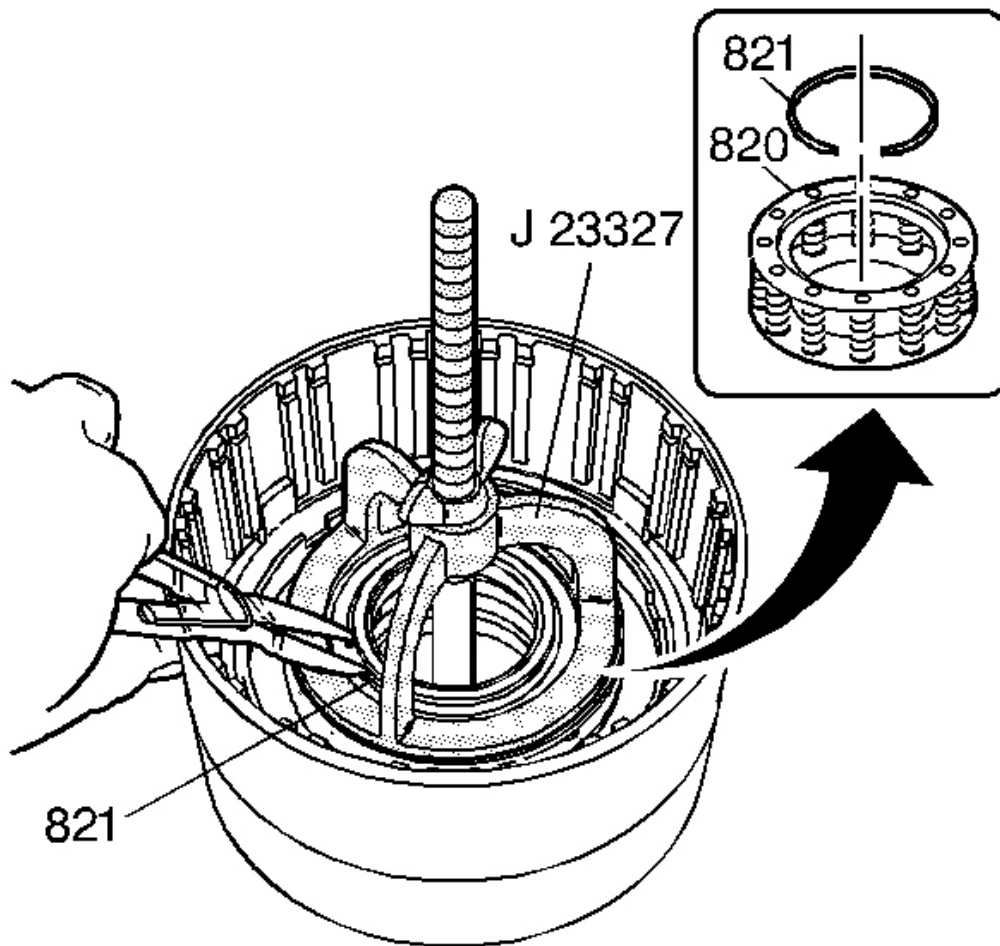


Fig. 97: Compressing Spring And Retainer Assembly Using The J 23327
Courtesy of GENERAL MOTORS CORP.

42. Using the **J 23327** , compress the spring and retainer assembly (820).

IMPORTANT: Do not overexpand the snap ring.

43. Remove the snap ring (821).
44. Remove the **J 23327** .
45. Remove the spring and retainer assembly (820).

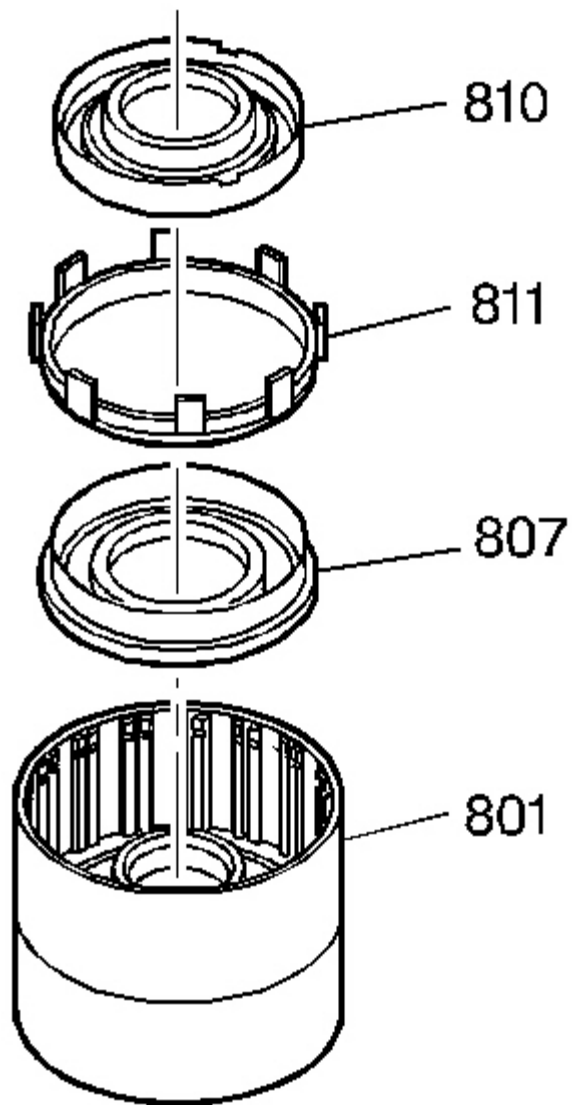


Fig. 98: Removing Coast Clutch Piston Assembly
Courtesy of GENERAL MOTORS CORP.

46. Remove the coast clutch piston assembly (810).
47. Remove the apply ring (811). Remove the forward clutch piston and seals assembly (807).

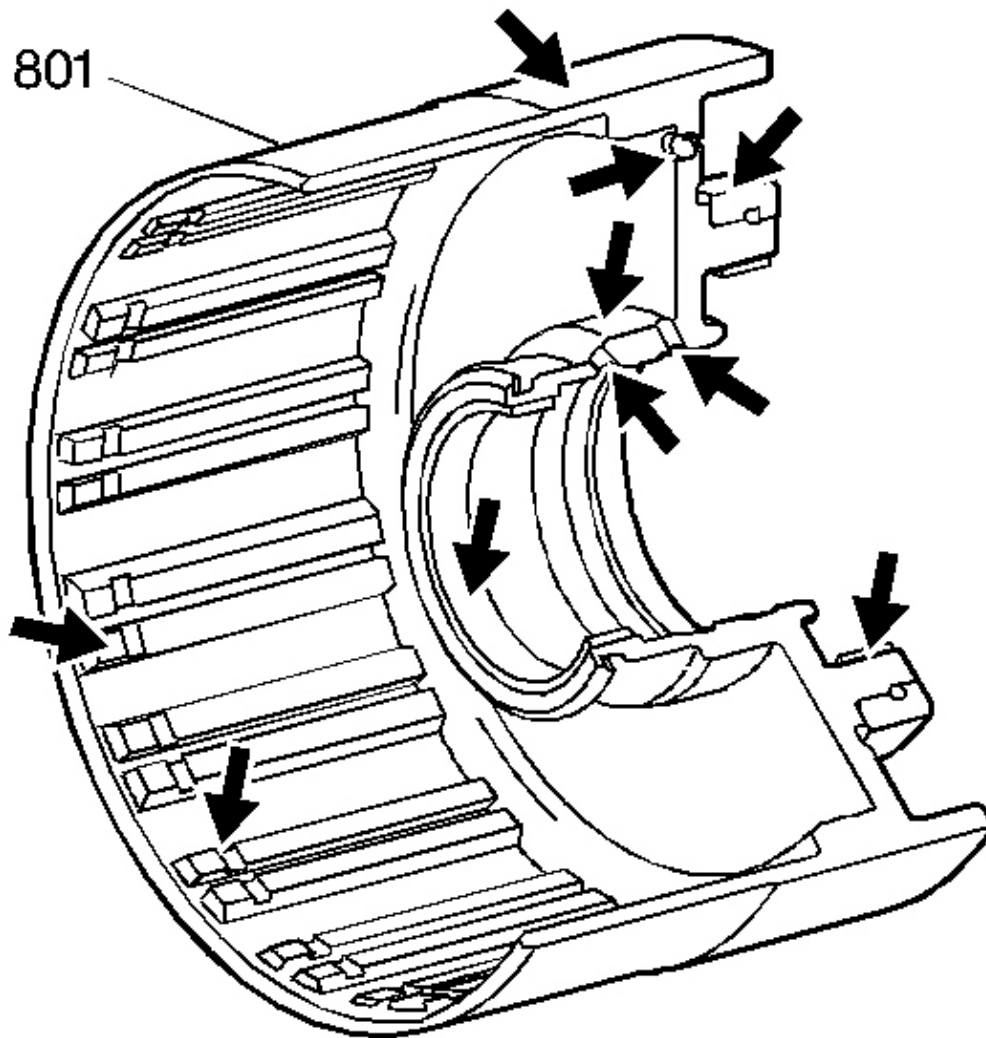


Fig. 99: Identifying Inspection Areas On Forward And Coast Clutch Housing
Courtesy of GENERAL MOTORS CORP.

48. Inspect the forward and coast clutch housing (801) for the following:

- Feed passages that are plugged
- Splines that are worn or damaged
- Checkball for leaks
- Welds for cracks

- Bushings for excessive wear

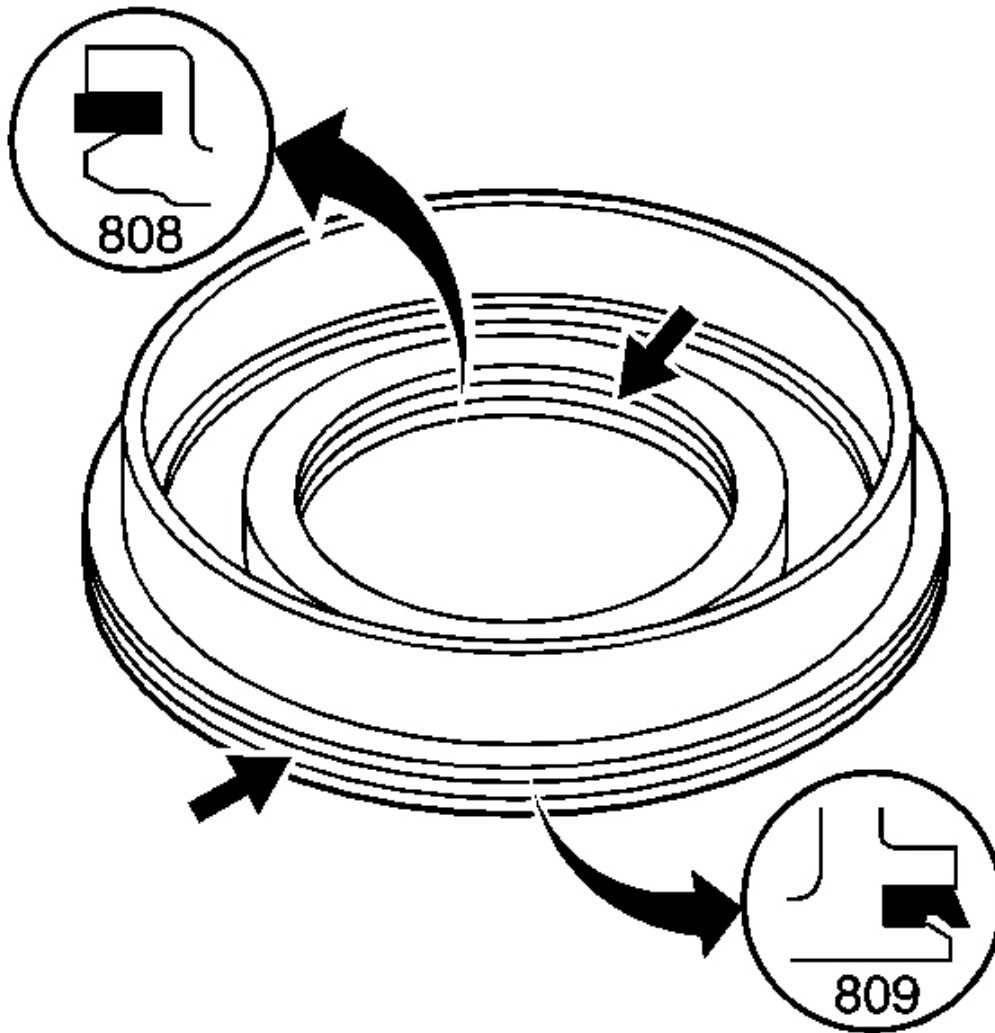


Fig. 100: View Of Forward Clutch Piston Seals Inspection Areas
Courtesy of GENERAL MOTORS CORP.

49. Inspect the forward clutch piston seals (808, 809) for damage. If the seals are damaged, replace the piston.
50. Inspect the forward clutch piston for cracks or damage to the seal grooves.

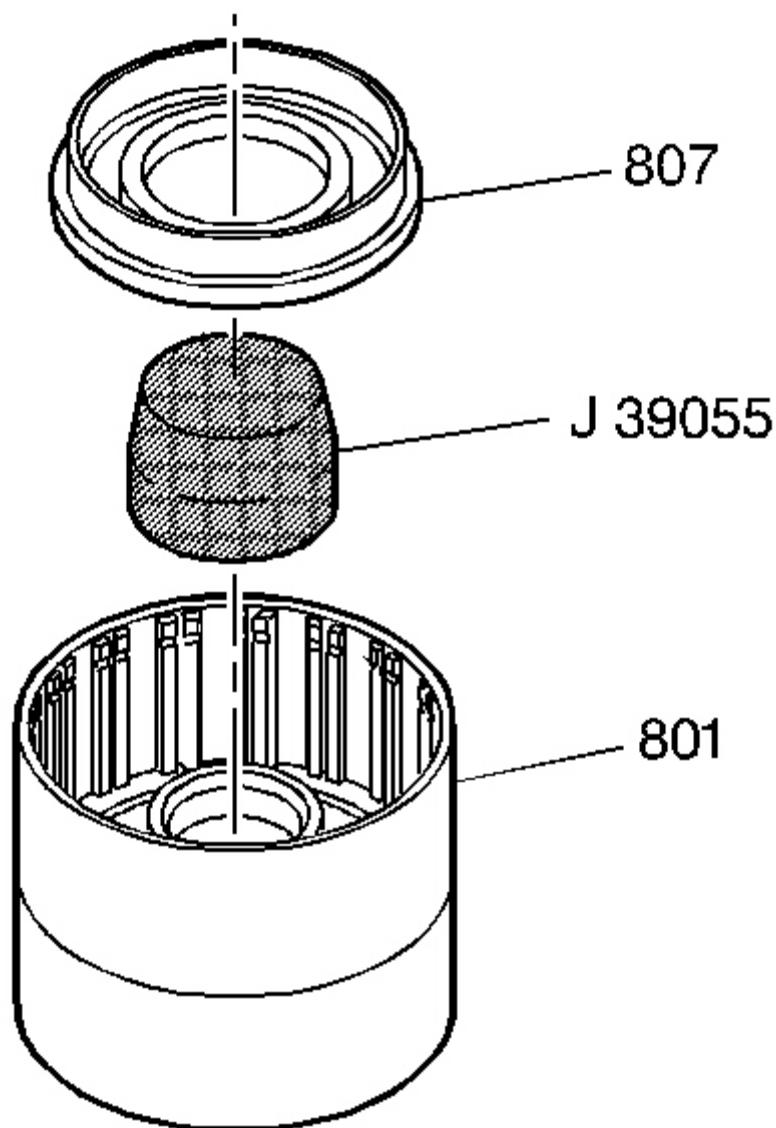


Fig. 101: Installing The Forward Clutch Piston (807) Into The Forward And Coast Clutch Housing Using J 39055
Courtesy of GENERAL MOTORS CORP.

51. Install the new piston seals onto the forward clutch piston (807). Make sure that the outer seal does not roll backwards.

52. Using the **J 39055** , install the forward clutch piston (807) into the forward and coast clutch housing (801). See **Special Tools**.
53. Remove the **J 39055** . See **Special Tools**.

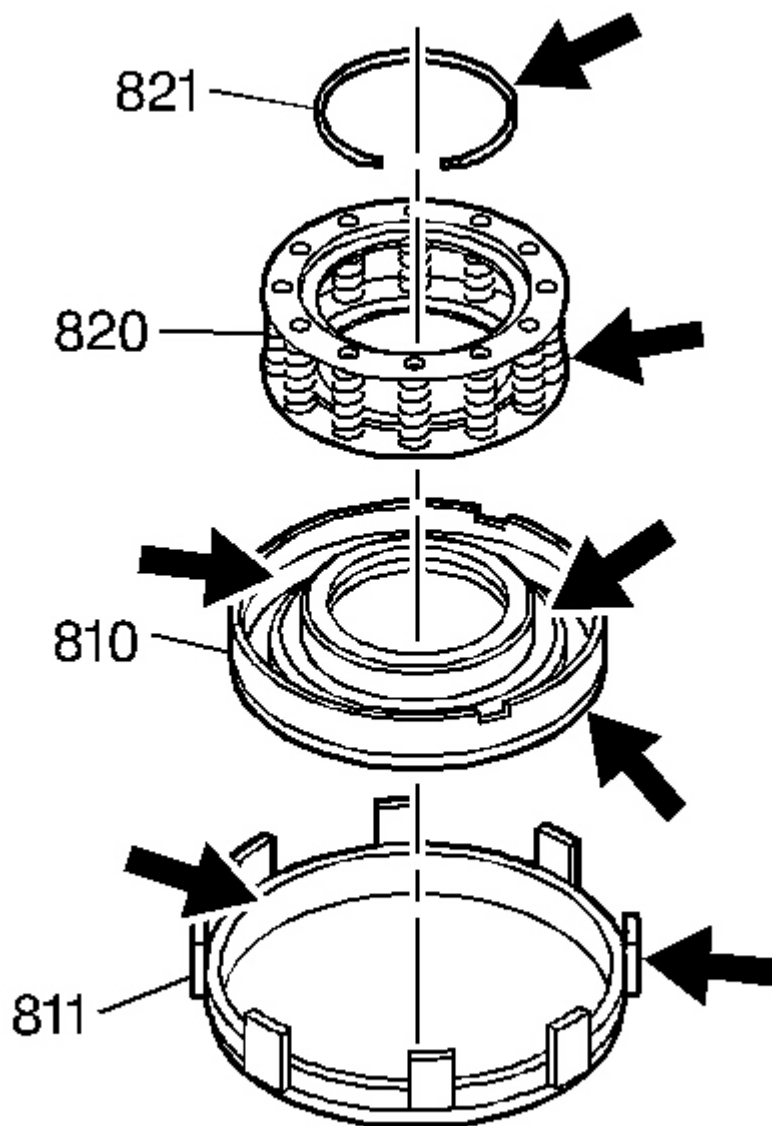


Fig. 102: Inspecting Coast Clutch Piston Assembly
Courtesy of GENERAL MOTORS CORP.

54. Inspect the snap ring (821) for damage.
55. Inspect the spring and retainer assembly (820) for a damaged cage and distorted or missing springs.
56. Inspect the coast clutch piston assembly (810) for damage.
57. Inspect the apply ring (811) for damage.

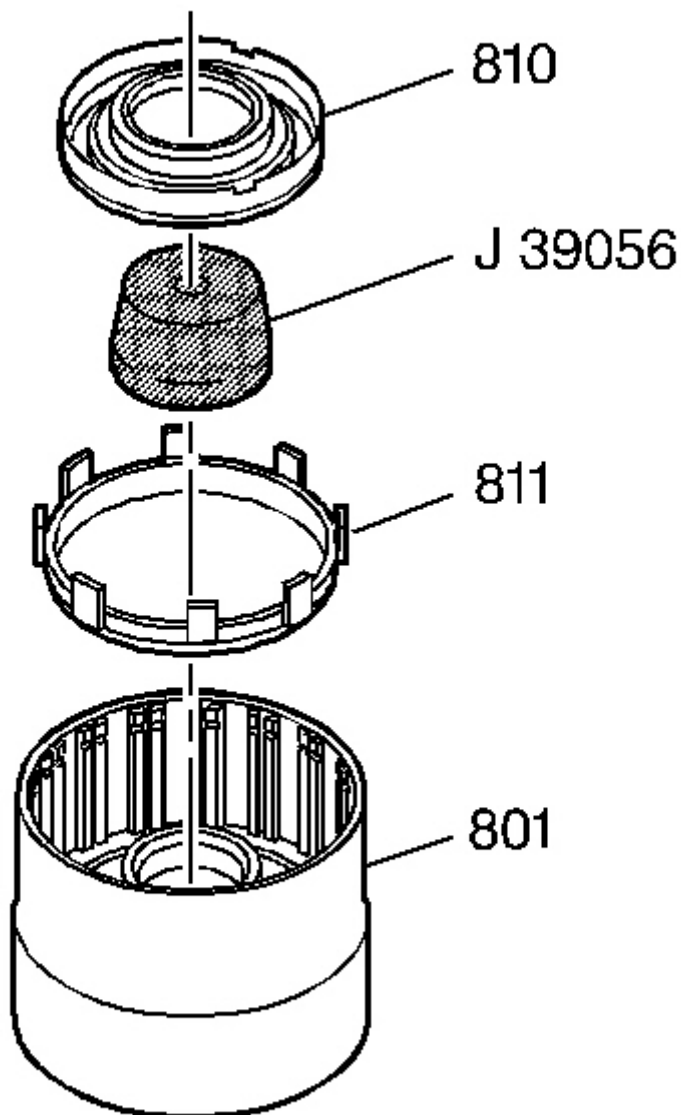


Fig. 103: Installing Coast Clutch Piston Assembly Into Coast Clutch Housing
Courtesy of GENERAL MOTORS CORP.

58. Install the apply ring (811) into the forward and coast clutch housing (801).
59. Using the **J 39056** , install the coast clutch piston assembly into the coast clutch housing. See **Special Tools**. Make sure that the outer seal does not roll backwards.
60. Remove the **J 39056** . See **Special Tools**.

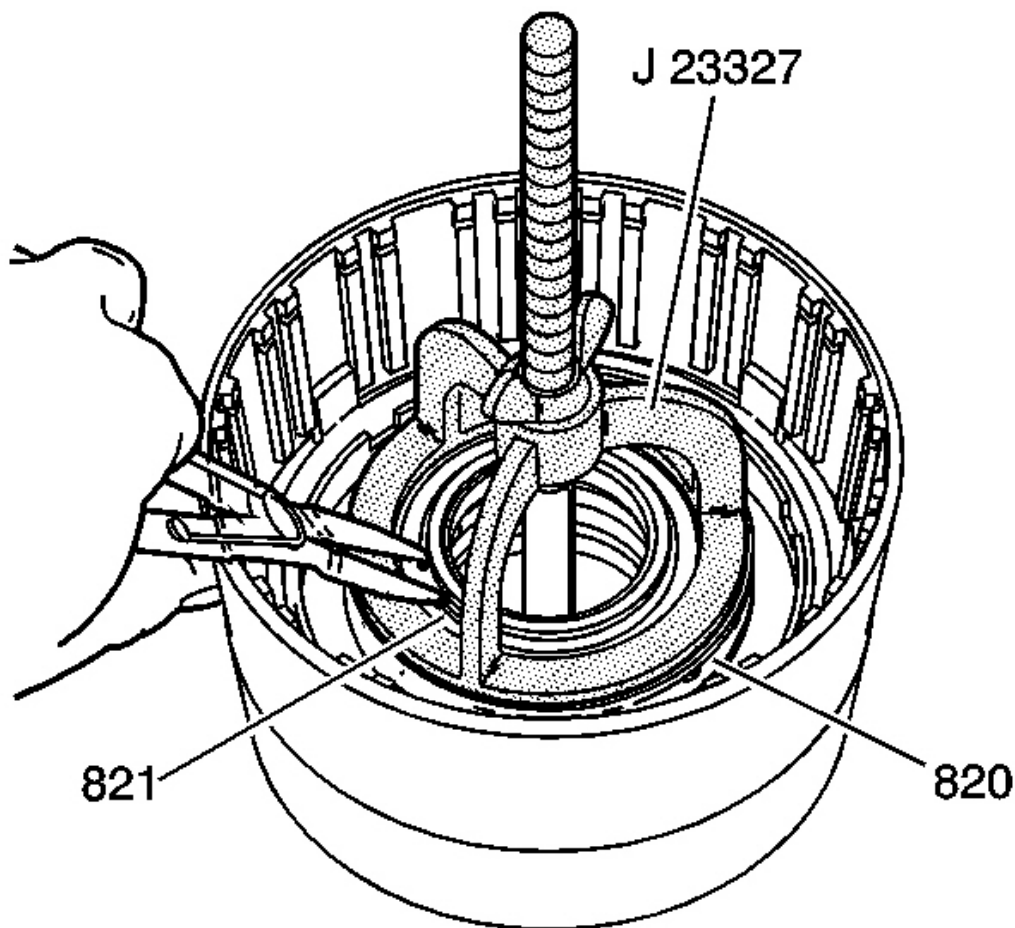


Fig. 104: Compressing Spring And Retainer Assembly Into Forward And Coast Clutch Housing Using J 23327
Courtesy of GENERAL MOTORS CORP.

61. Install the spring and retainer assembly (820) into the forward and coast clutch housing.
62. Using the **J 23327** , compress the spring and retainer assembly (820). Install the snap ring (821).
63. Remove the **J 23327** .

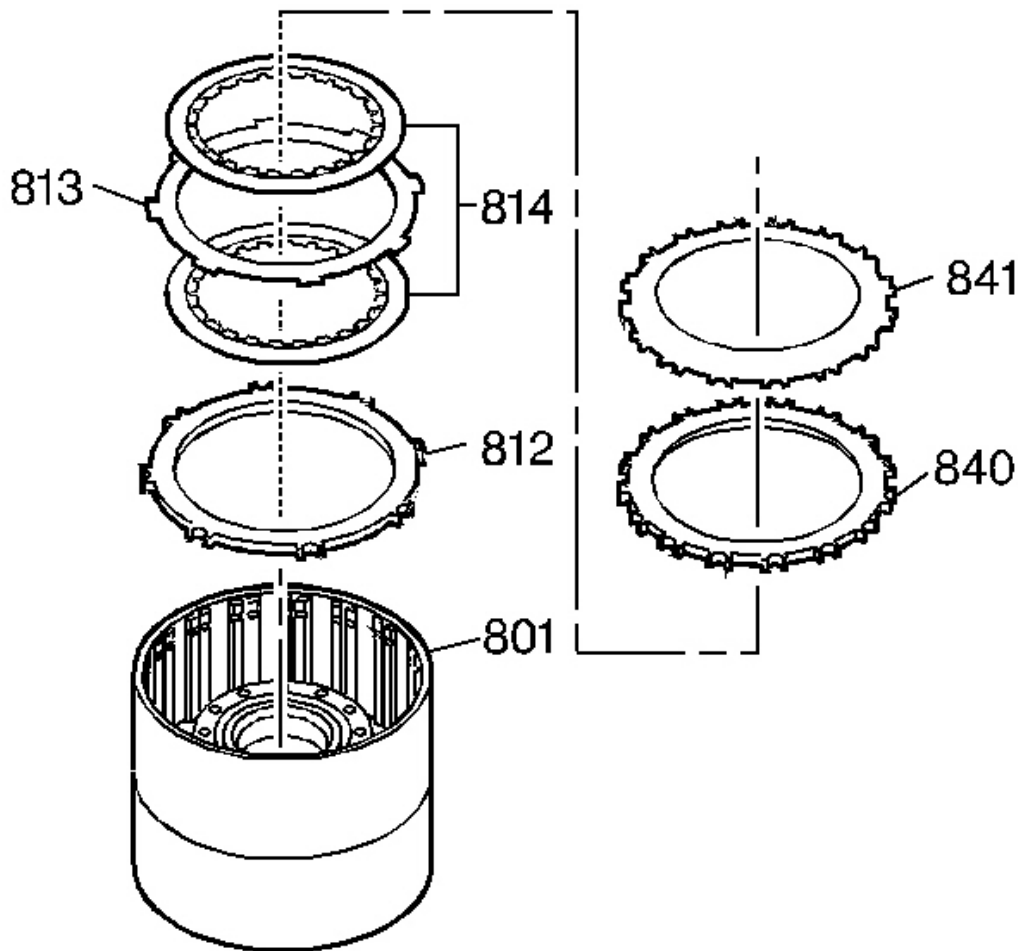


Fig. 105: Locating Coast Clutch Plates
Courtesy of GENERAL MOTORS CORP.

64. Install the coast clutch apply plate (812) into the forward and coast clutch housing (801).
65. Install the coast clutch fiber (814) and steel (813) plates.

66. Install the forward and coast clutch plate (840), and the forward and coast clutch belleville plate (841).

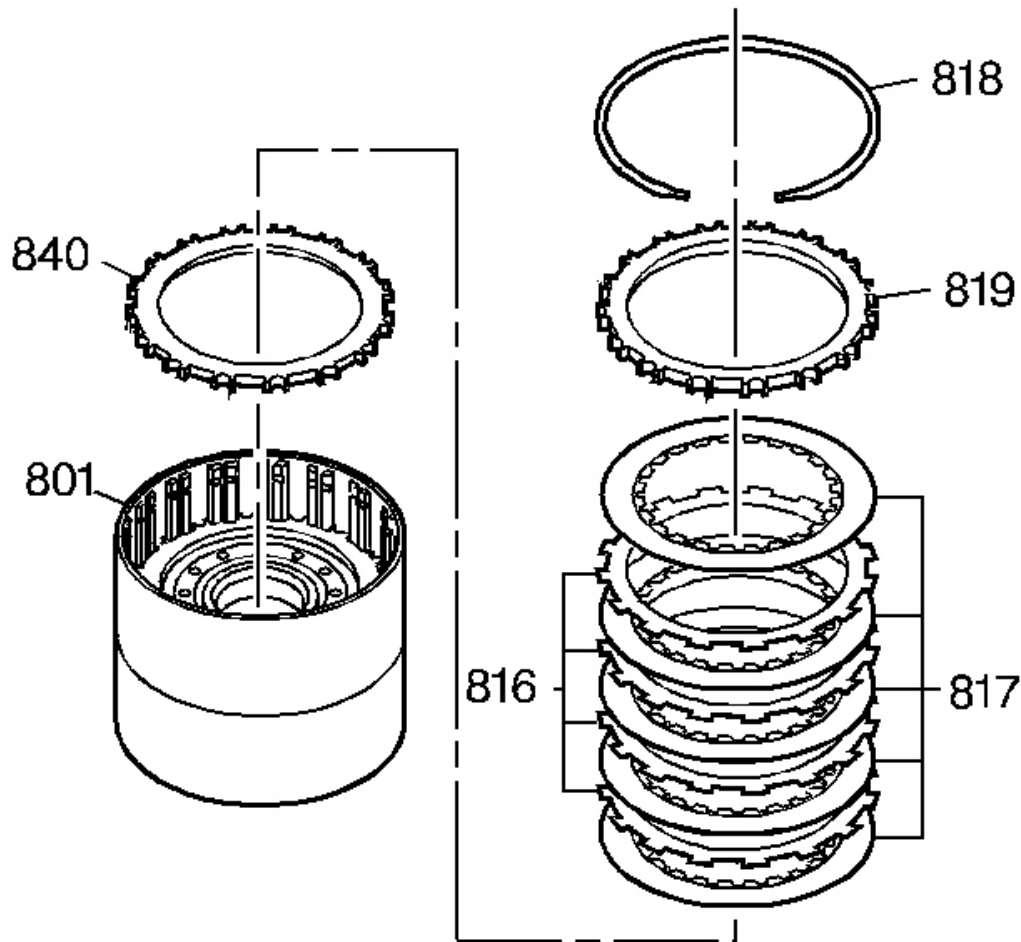


Fig. 106: Identifying Forward Clutch Plates
Courtesy of GENERAL MOTORS CORP.

67. Install the forward and coast clutch plate (840)
68. Install all of the forward clutch fiber (817) and steel (816) plates.
69. Install the forward clutch backing plate (819).
70. Install the snap ring (818).

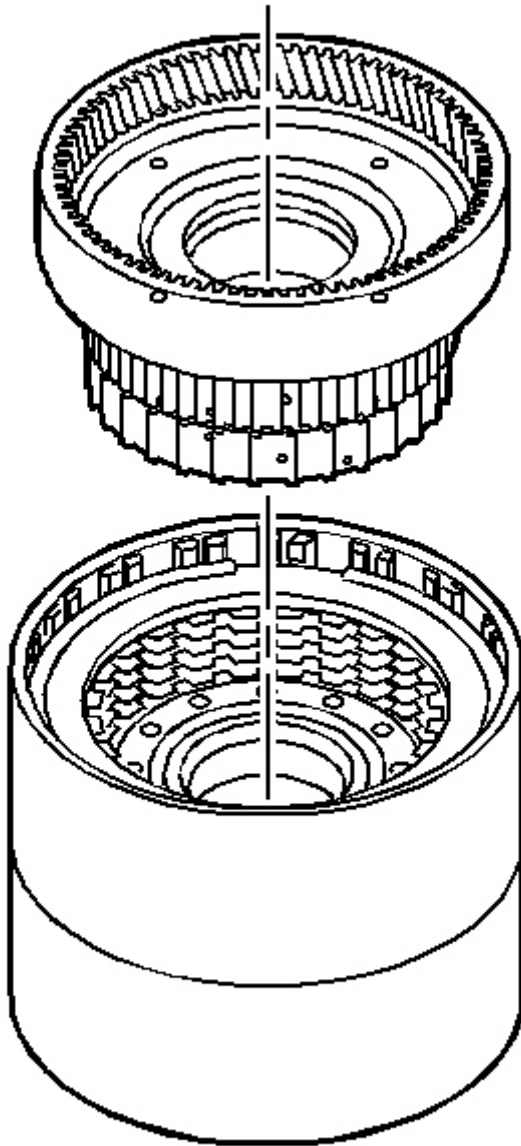


Fig. 107: Locating Coast Clutch Hub With The Thrust Bearing
Courtesy of GENERAL MOTORS CORP.

71. Install the coast clutch hub with the thrust bearing, the forward sprag race, and the input internal gear and flange into the forward and coast clutch housing.

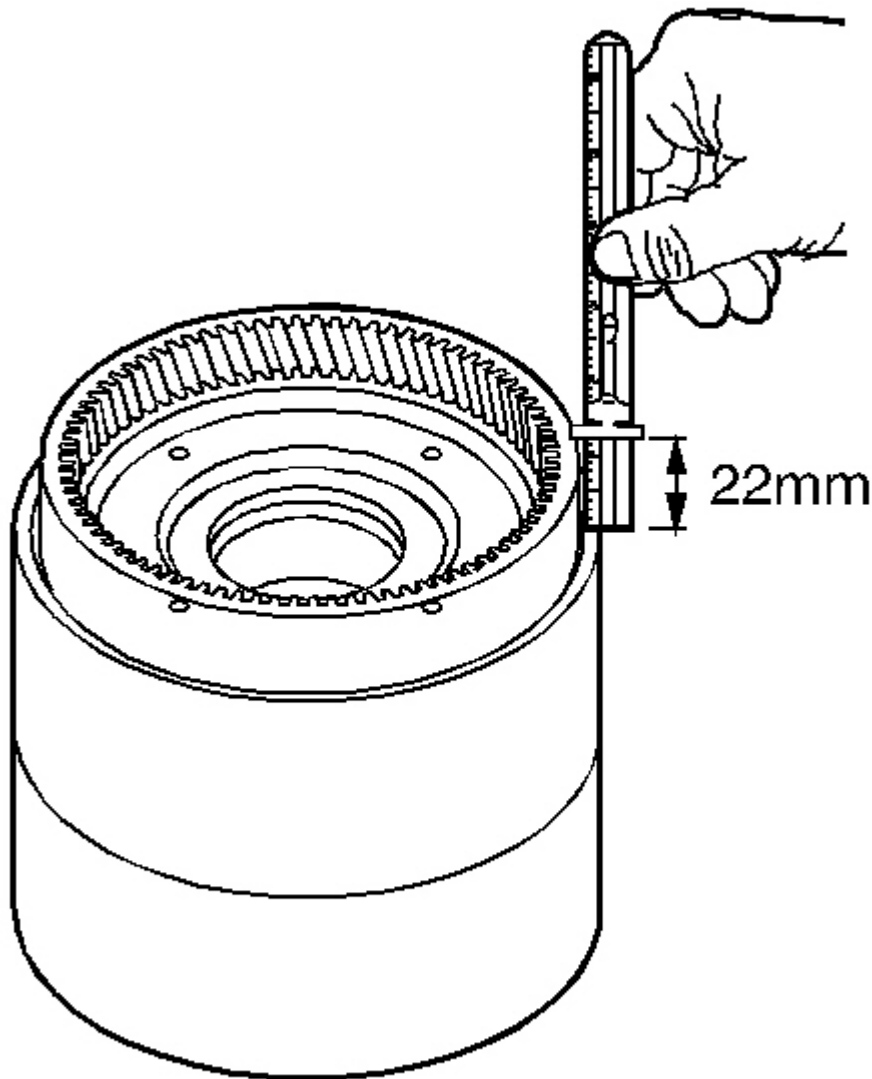


Fig. 108: Measuring Input Carrier And Reaction Internal Gear To Edge Of The Input Internal Gear

Courtesy of GENERAL MOTORS CORP.

72. When the splines on the hubs are properly engaged, the bushing on the input carrier will drop below the forward and coast clutch support hub, producing a dull metal sound. The distance from the top edge of the forward and coast clutch housing to the top edge of the

input internal gear is approximately 22 mm (0.886 in).

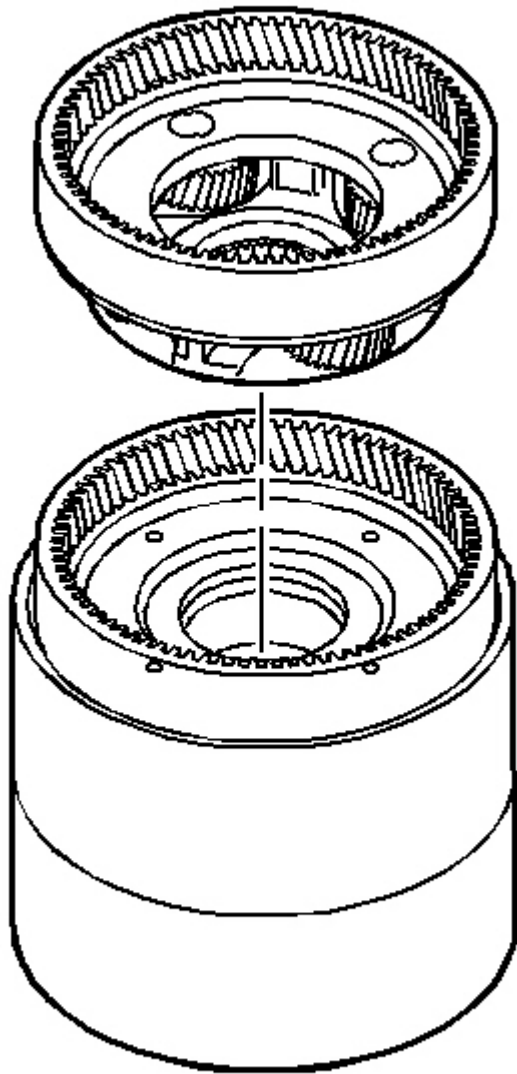


Fig. 109: Installing Input Carrier And Reaction Internal Gear
Courtesy of GENERAL MOTORS CORP.

73. Install the input carrier and reaction internal gear with the thrust bearing onto the input internal gear.

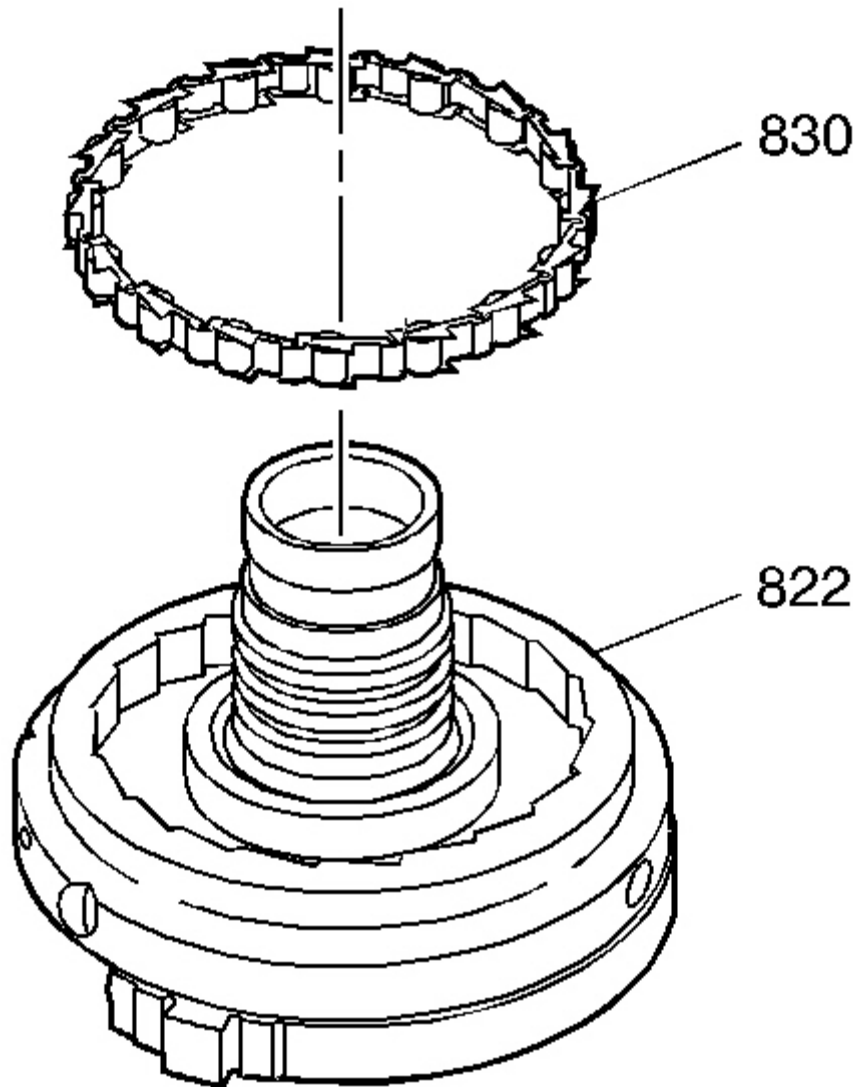


Fig. 110: Removing Low Roller Clutch Assembly
Courtesy of GENERAL MOTORS CORP.

74. Remove the low roller clutch assembly (830) from the forward and coast clutch support (822).

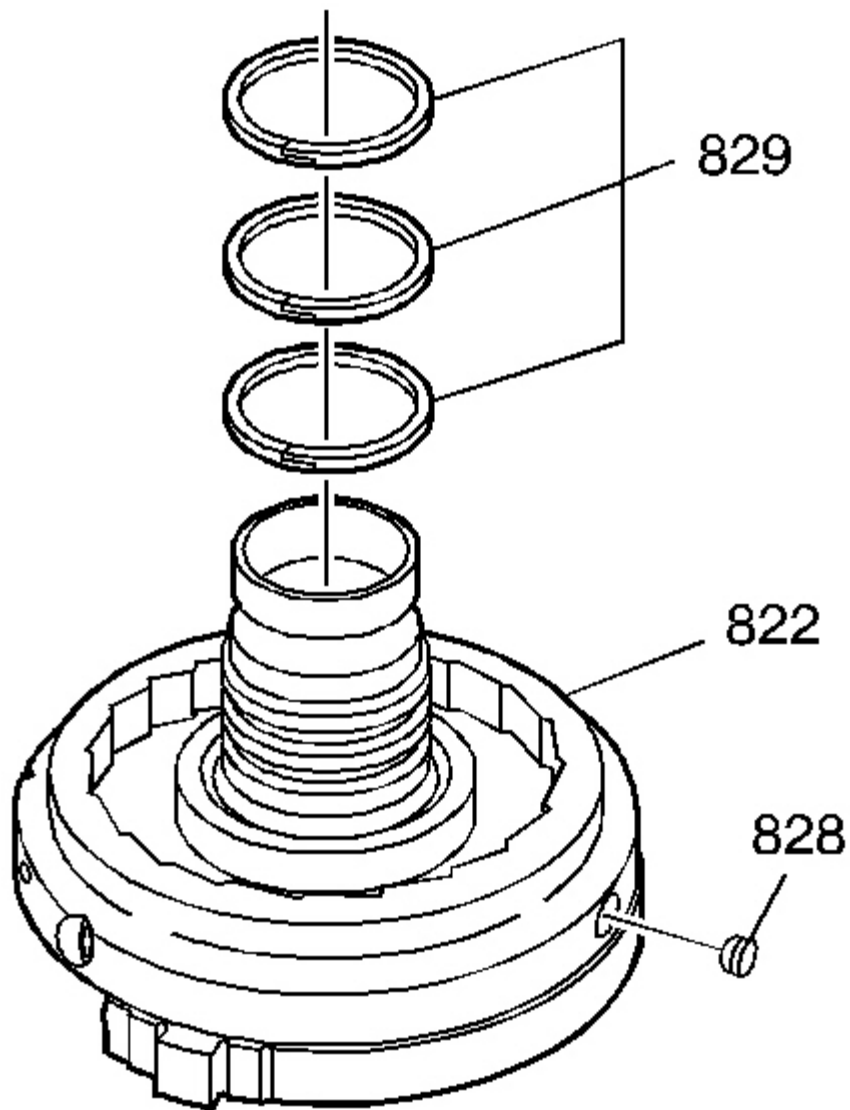


Fig. 111: View Of Oil Seal Rings
Courtesy of GENERAL MOTORS CORP.

75. Remove the three oil seal rings (829) from the forward and coast clutch support (822).
76. Remove the cooler return seal (828).

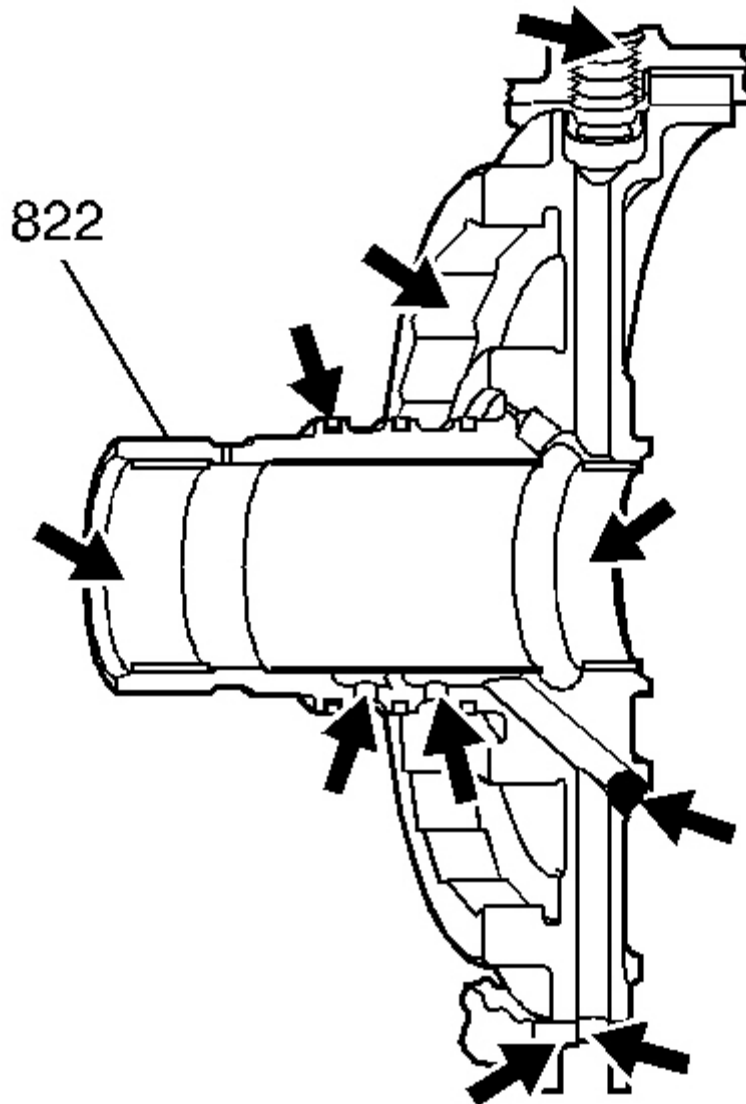


Fig. 112: Inspection Areas On Forward And Coast Clutch Support
Courtesy of GENERAL MOTORS CORP.

77. Inspect the forward and coast clutch support (822) for the following:
- Damage to the seal ring grooves
 - Damage to the checkball

- Damage and wear to the bushing and transfer sleeve

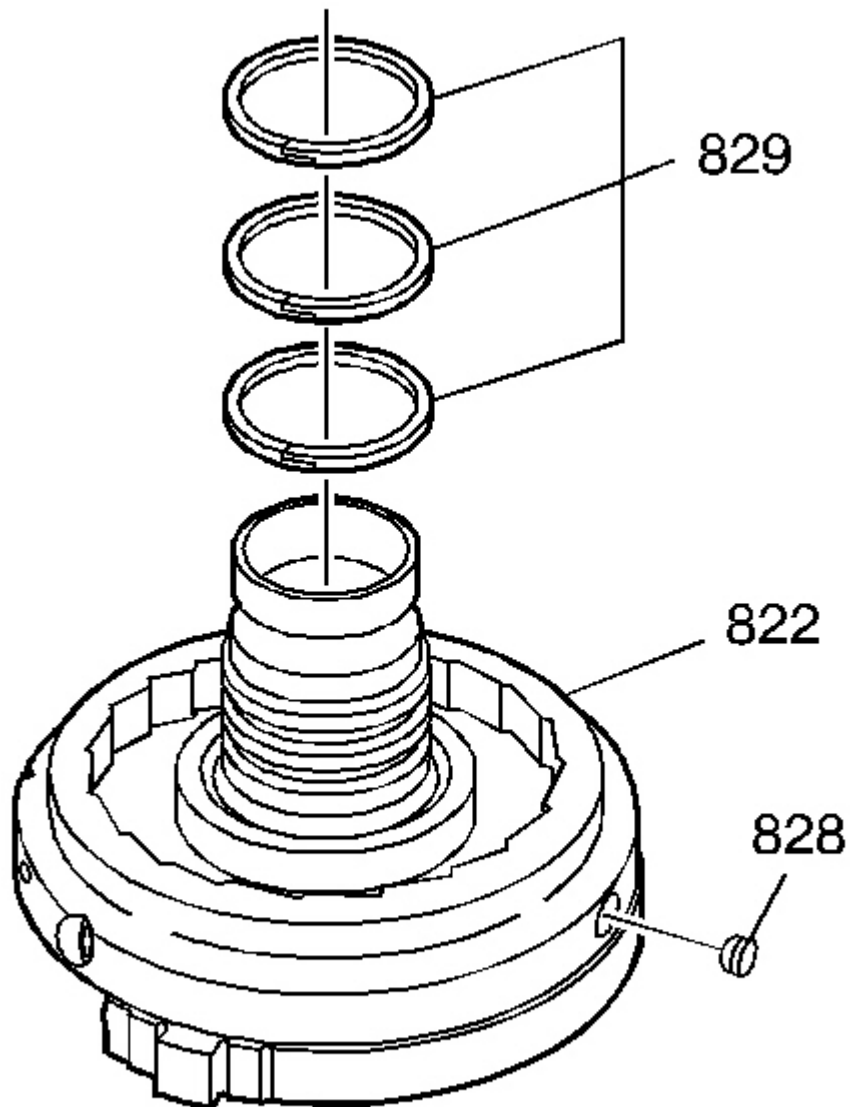


Fig. 113: View Of Oil Seal Rings
Courtesy of GENERAL MOTORS CORP.

78. Install new oil seal rings (829).

IMPORTANT: Do not press the seal so that the shape of the seal is distorted in the bore.

79. Install a new cooler return seal (828) with the appropriate socket.

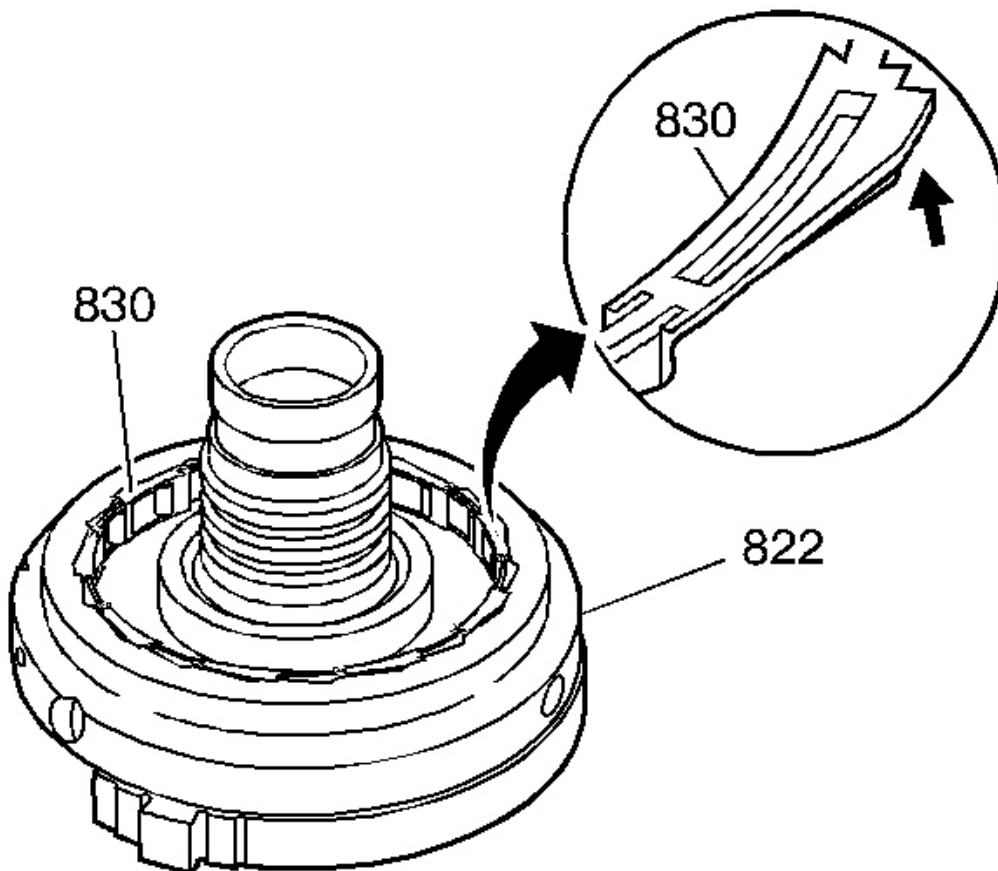


Fig. 114: Aligning Low Roller Clutch Assembly
Courtesy of GENERAL MOTORS CORP.

80. Install the low roller clutch assembly (830) into the forward and coast clutch support (822). Turn the low roller clutch assembly (830) counterclockwise as far as it can go. The tabs on the low roller clutch assembly (830) must rest on the face of the forward and coast clutch support (822).

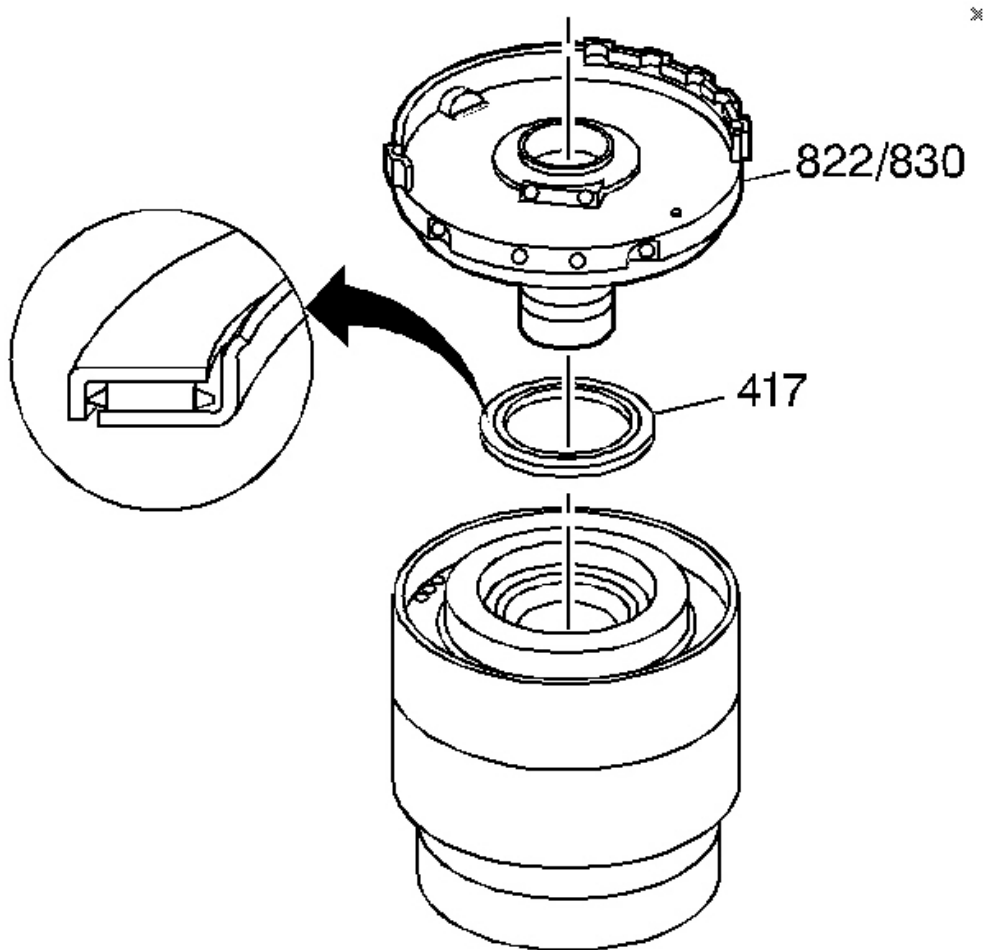


Fig. 115: Installing Forward And Coast Clutch Assembly Thrust Bearing
Courtesy of GENERAL MOTORS CORP.

81. Install the thrust bearing (417) onto the forward and coast clutch assembly.
82. Install the forward and coast clutch support and low roller clutch assembly (822/830) onto the forward and coast clutch assembly.

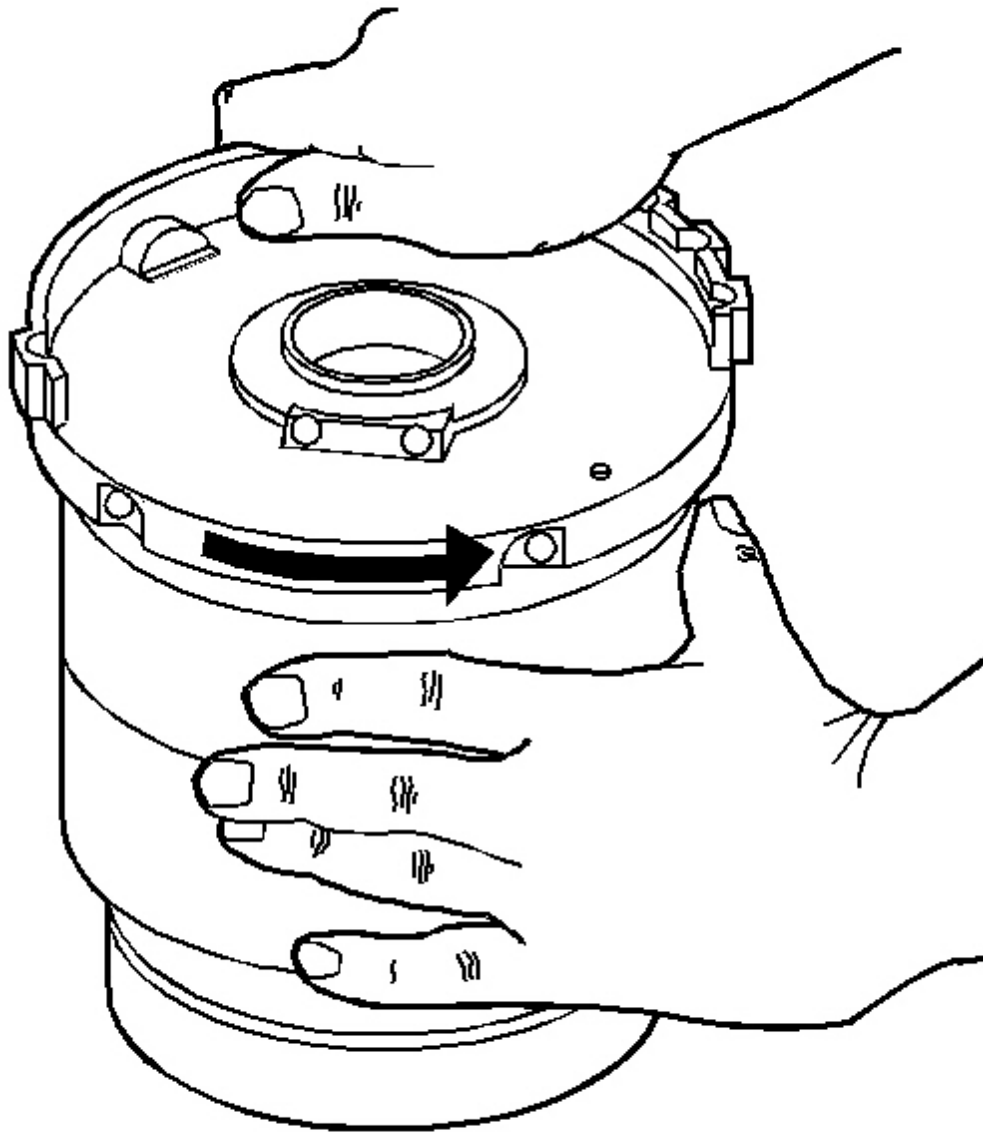


Fig. 116: Checking Low Roller Clutch Assembly Rotation
Courtesy of GENERAL MOTORS CORP.

83. Check the rotation of the low roller clutch assembly. The low roller clutch assembly should freewheel in the counterclockwise direction.

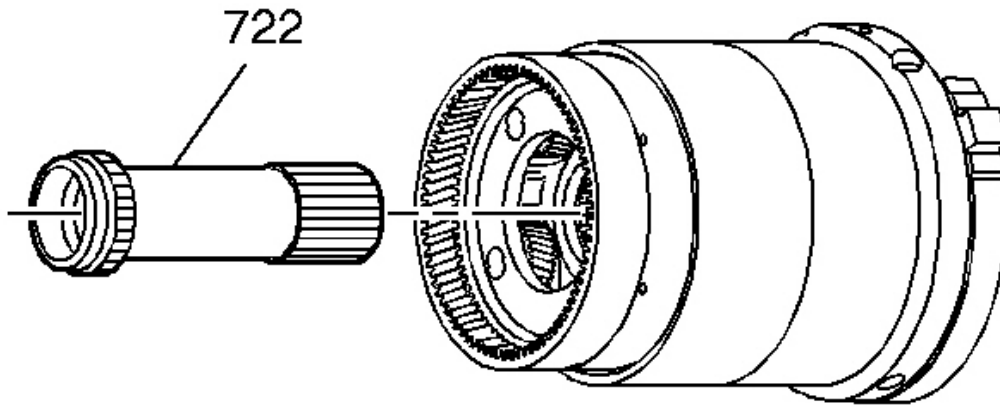


Fig. 117: Locating Final Drive Sun Gear Shaft
Courtesy of GENERAL MOTORS CORP.

84. Install the final drive sun gear shaft (722).

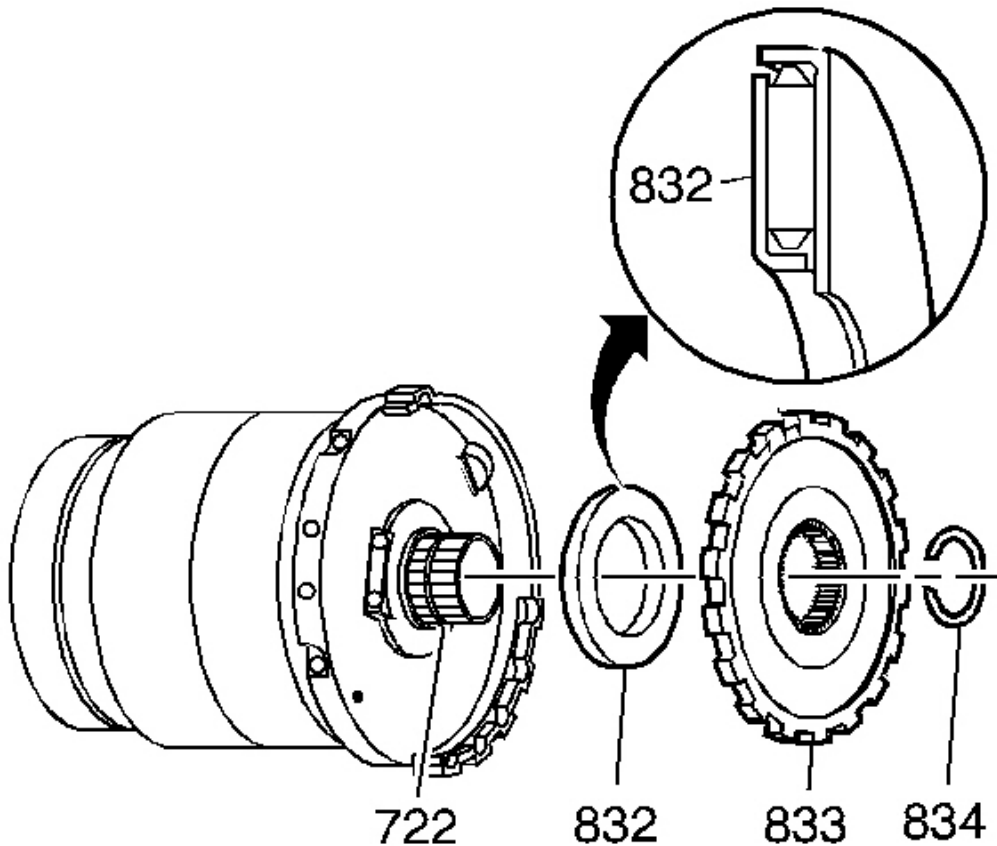


Fig. 118: Identifying Parking Lock Gear And Final Drive Sun Gear Shaft Components

Courtesy of GENERAL MOTORS CORP.

85. Install the thrust bearing (832), the parking lock gear (833), and the snap ring (834) onto the final drive sun gear shaft (722).

LOW/REVERSE BAND AND FRETTING RING INSTALLATION

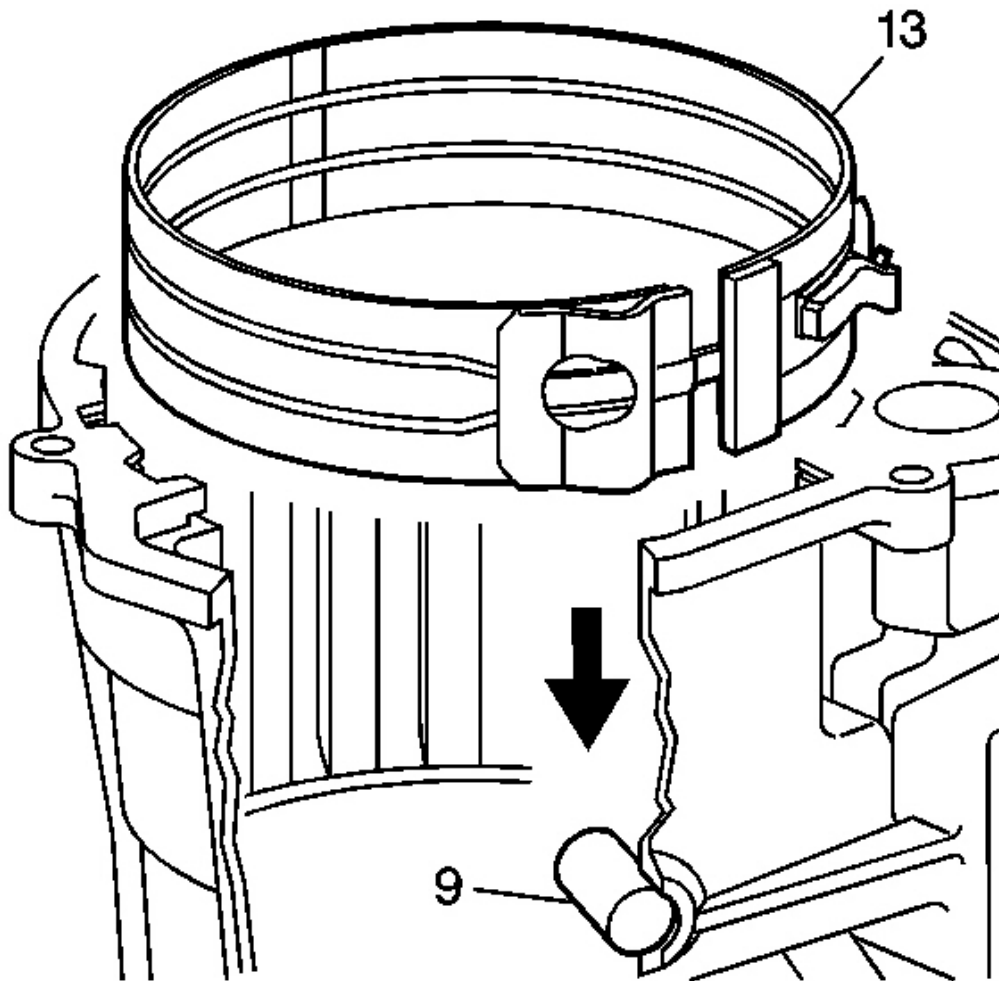


Fig. 119: Installing Low Reverse Band
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: It may be easier to install the low reverse band if it is installed on the anchor pin first.

1. Install the low reverse band (13) into the case. Be sure to properly anchor the band in the case with the servo pin stop at the case bore.

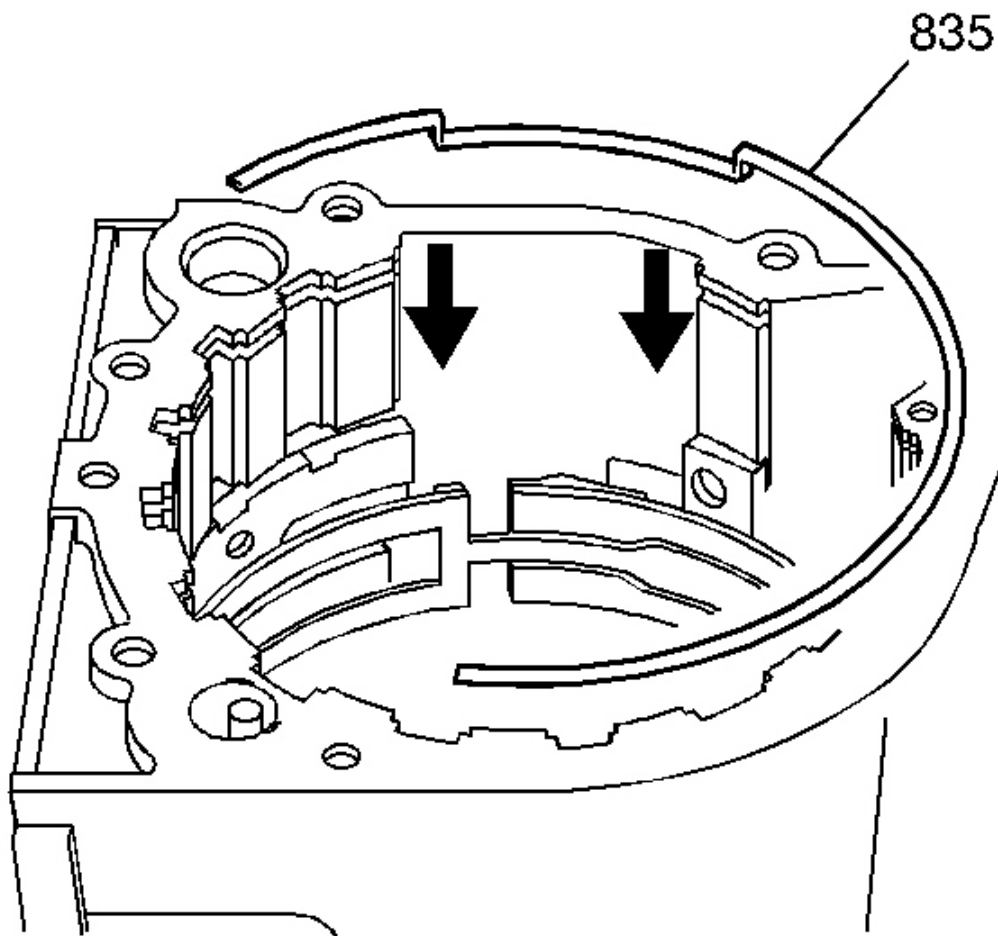


Fig. 120: View Of Fretting Ring
Courtesy of GENERAL MOTORS CORP.

2. Install the fretting ring (835) into the case. Keep the gap in the fretting ring toward the bottom pan with the recessed area next to the anchor pin.

FORWARD AND COAST CLUTCH INSTALLATION

Tools Required

J 39053 Forward and Coast Clutch Assembly Installer. See **Special Tools**.

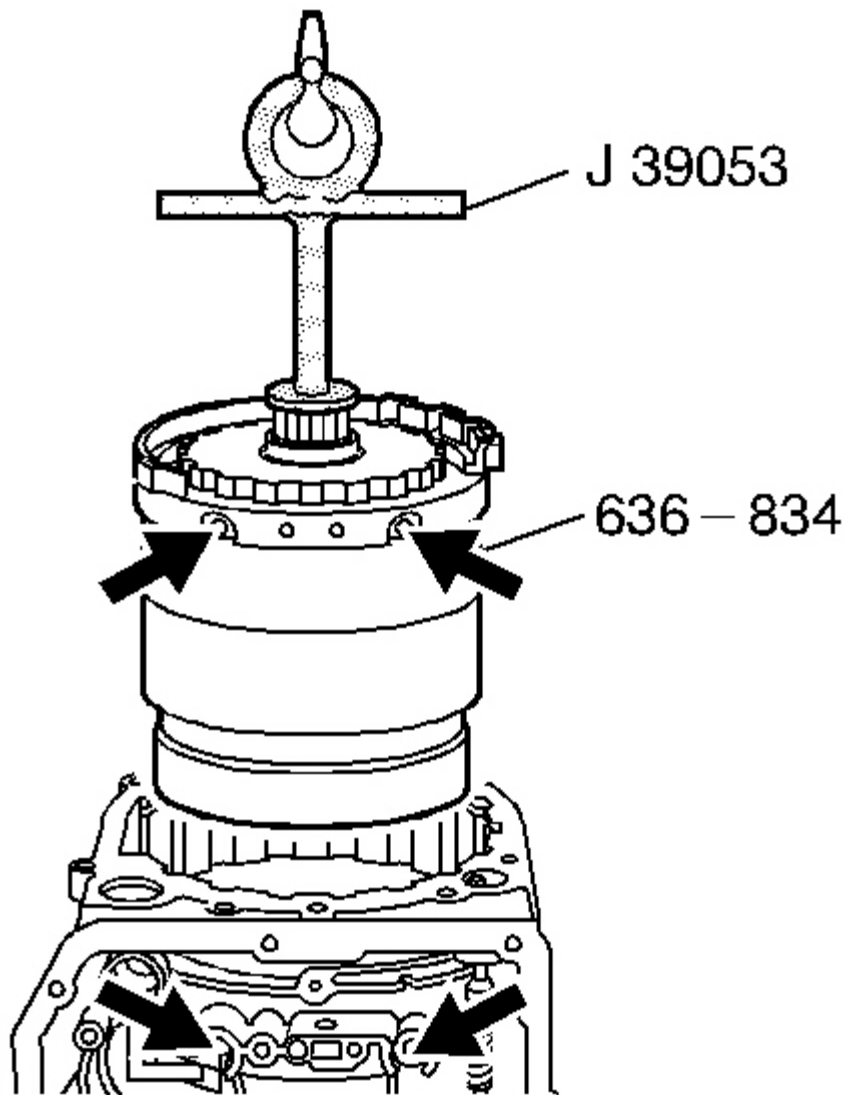


Fig. 121: Installing The Forward And Coast Clutch And Support Assembly (636-834) Into The Barrel Of The Case

Courtesy of GENERAL MOTORS CORP.

CAUTION: The forward and coast clutch assembly weighs approximately 50 lbs. Personal injury may result if you drop the assembly.

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

1. Install the **J 39053** into the forward and coast clutch and support assembly (636-834). See **Special Tools**.
2. Using a chain hoist or suitable lifting equipment, install the forward and coast clutch and support assembly (636-834) into the barrel of the case. The two bolt holes and feed holes must line up with the holes in the bottom of the case.

FINAL DRIVE INTERNAL GEAR AND SNAP RING INSTALLATION

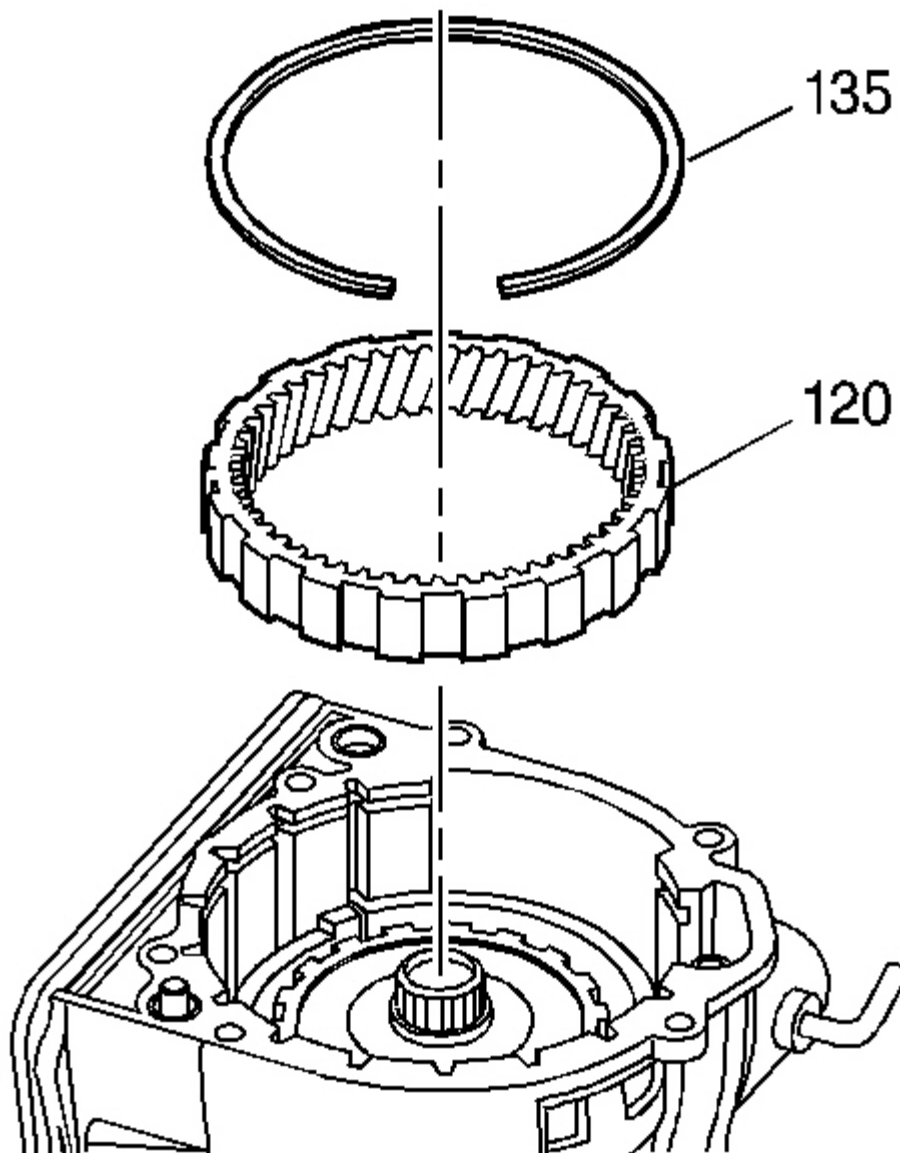


Fig. 122: View Of Final Drive Internal Gear With Groove Aligned Up
Courtesy of GENERAL MOTORS CORP.

1. Install the final drive internal gear (120) with the groove up.
2. Install the final drive internal gear snap ring (135) flat side down.

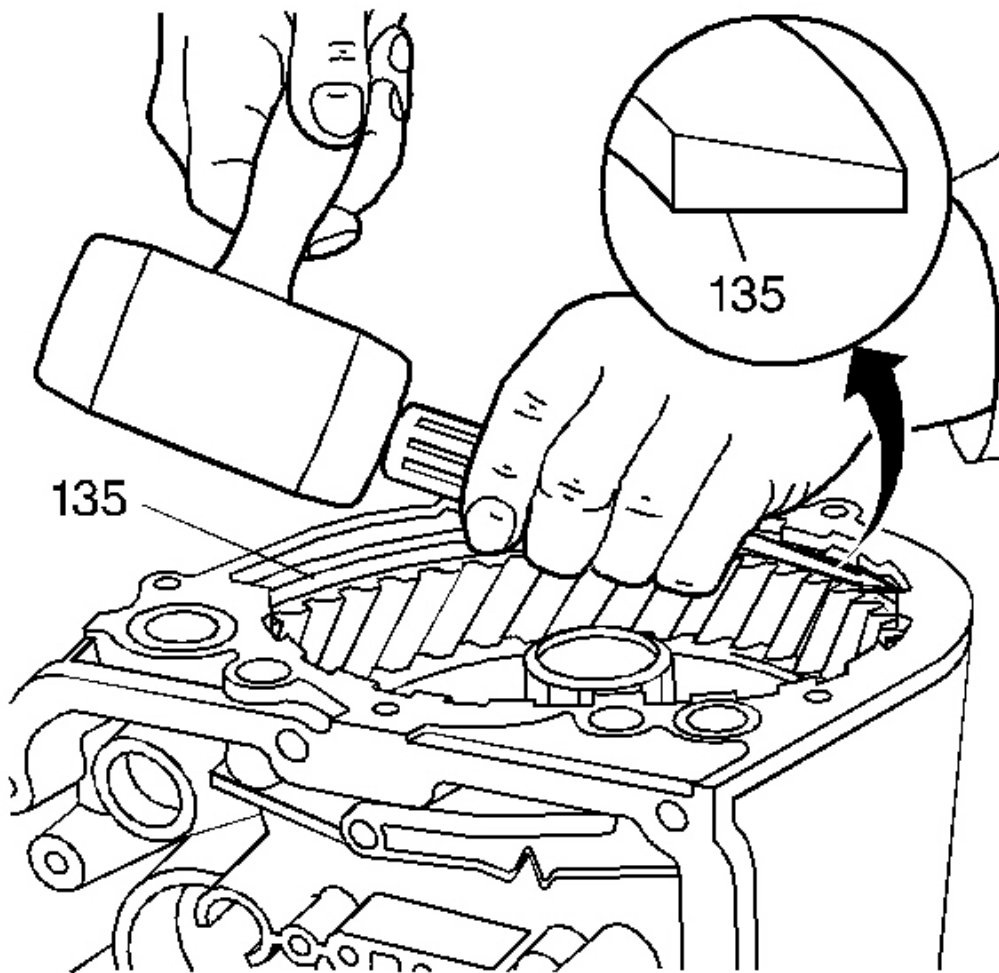


Fig. 123: Setting Final Drive Internal Gear Snap Ring With A Punch
Courtesy of GENERAL MOTORS CORP.

3. The final drive internal gear snap ring (135) opening should be in the actuator rod area. Set the final drive internal gear snap ring (135) in place with a light tap on a punch.

FORWARD CLUTCH SUPPORT STUD INSTALLATION

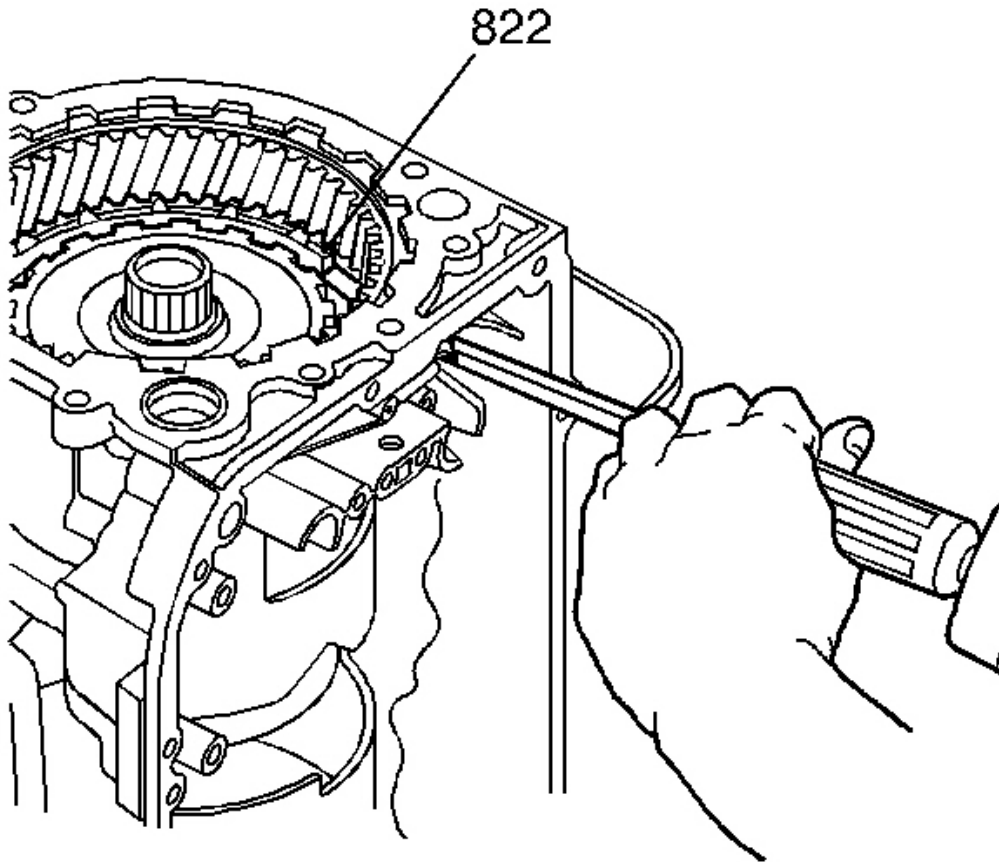


Fig. 124: Rotating Forward And Coast Clutch Support Counterclockwise Against The Spline

Courtesy of GENERAL MOTORS CORP.

1. Rotate the forward and coast clutch support (822) counterclockwise against the spline. Do this by tapping on the support in a counterclockwise direction against the splines.

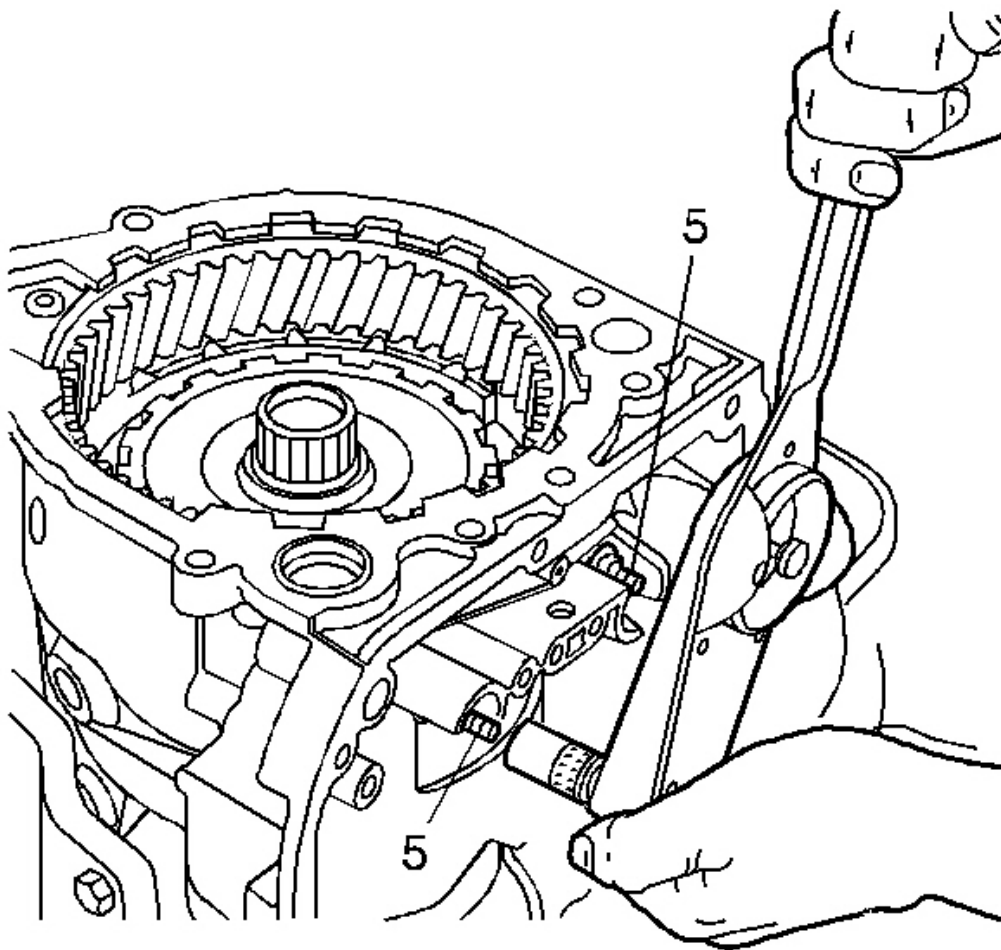


Fig. 125: Installing Forward Clutch Support Studs
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to **FASTENER NOTICE** in Cautions and Notices.

2. Install the forward clutch support studs (5). First tighten the stud closest to the bench (or the rear of the vehicle). Then tighten the second stud.

Tighten: Tighten the studs to 25-27 N.m (19-20 lb ft).

PARKING PAWL AND PIVOT PIN INSTALL

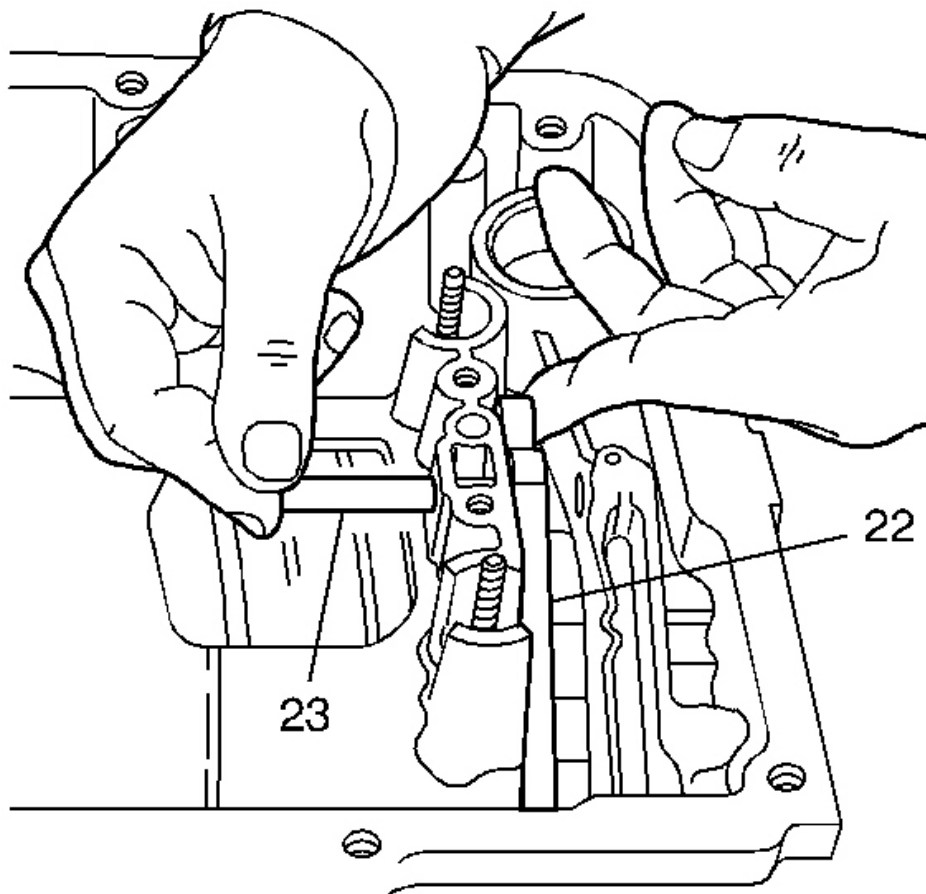


Fig. 126: Installing Parking Pawl Pivot Pin
Courtesy of GENERAL MOTORS CORP.

1. Place the parking pawl (22) into the case slot.
2. Install the parking pawl pivot pin (23) into the case.
3. Install the parking pawl spring over the parking pawl. The hook end of the spring locates on the case, and the square end goes on top of the parking pawl.

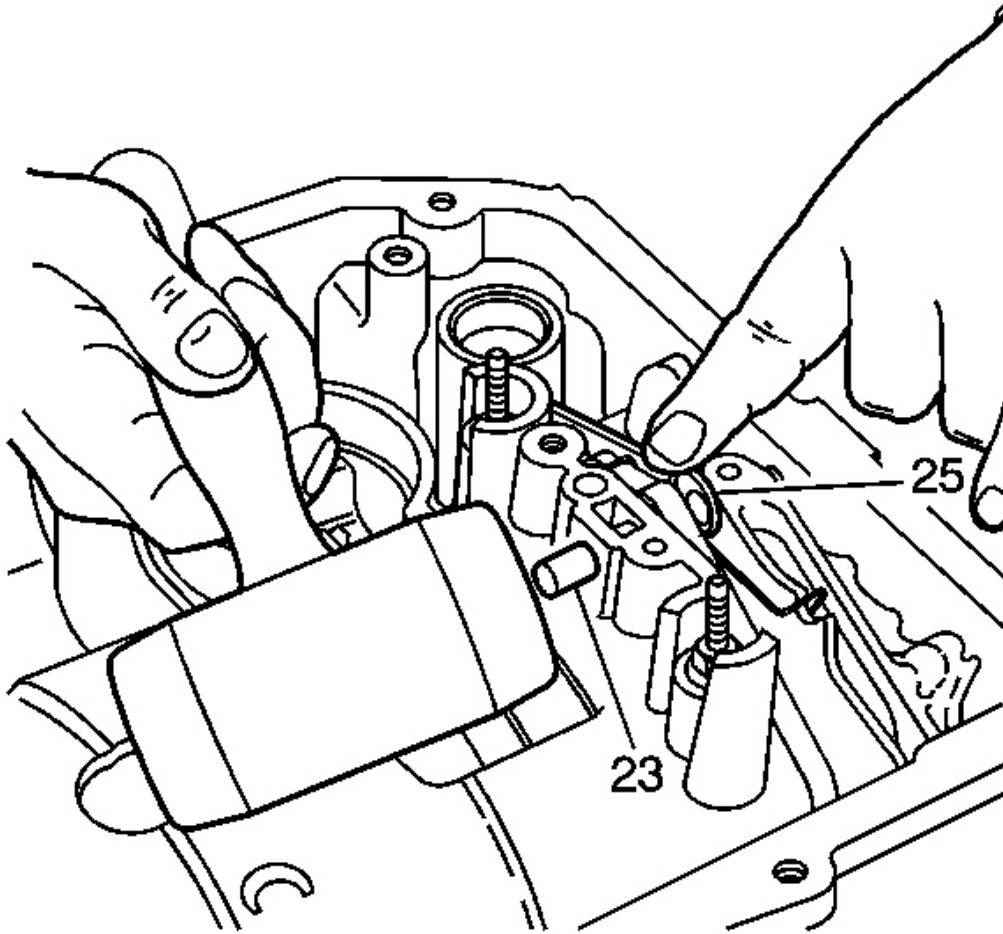


Fig. 127: Checking Parking Pawl
Courtesy of GENERAL MOTORS CORP.

4. Tap the parking pawl pivot pin (23) in place while pressing down on the pawl and spring assembly (25).
5. Verify the correct function of the parking pawl by moving the manual shaft and detent lever through the different ranges. Then return the manual shaft to the Park position.

THIRD CLUTCH AND REACTION CARRIER DISASSEMBLE

Tools Required

J 39694 Clutch Compressor. See Special Tools.

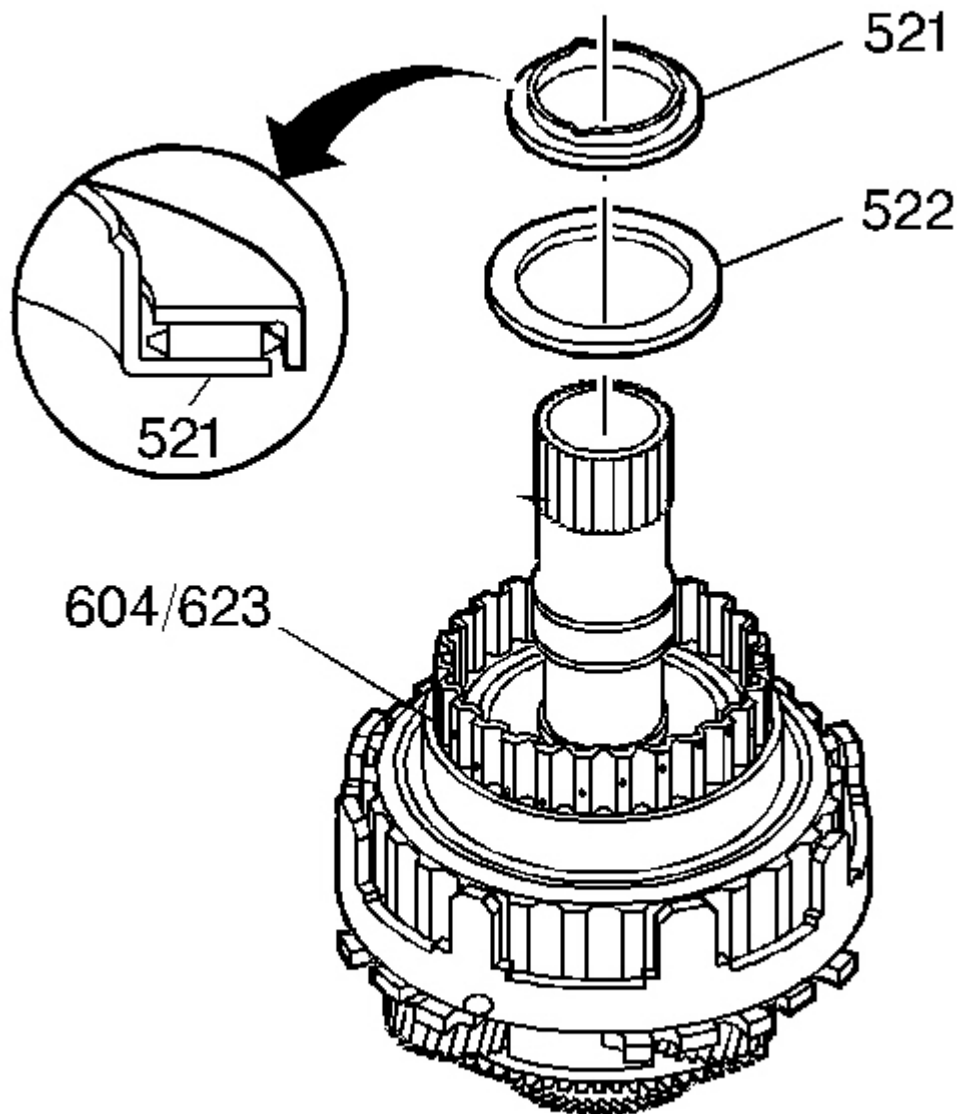


Fig. 128: Locating Selective Washer & Thrust Bearing
Courtesy of GENERAL MOTORS CORP.

1. Remove the thrust bearing (521) and remove the selective thrust washer (522) from the third clutch housing (604).

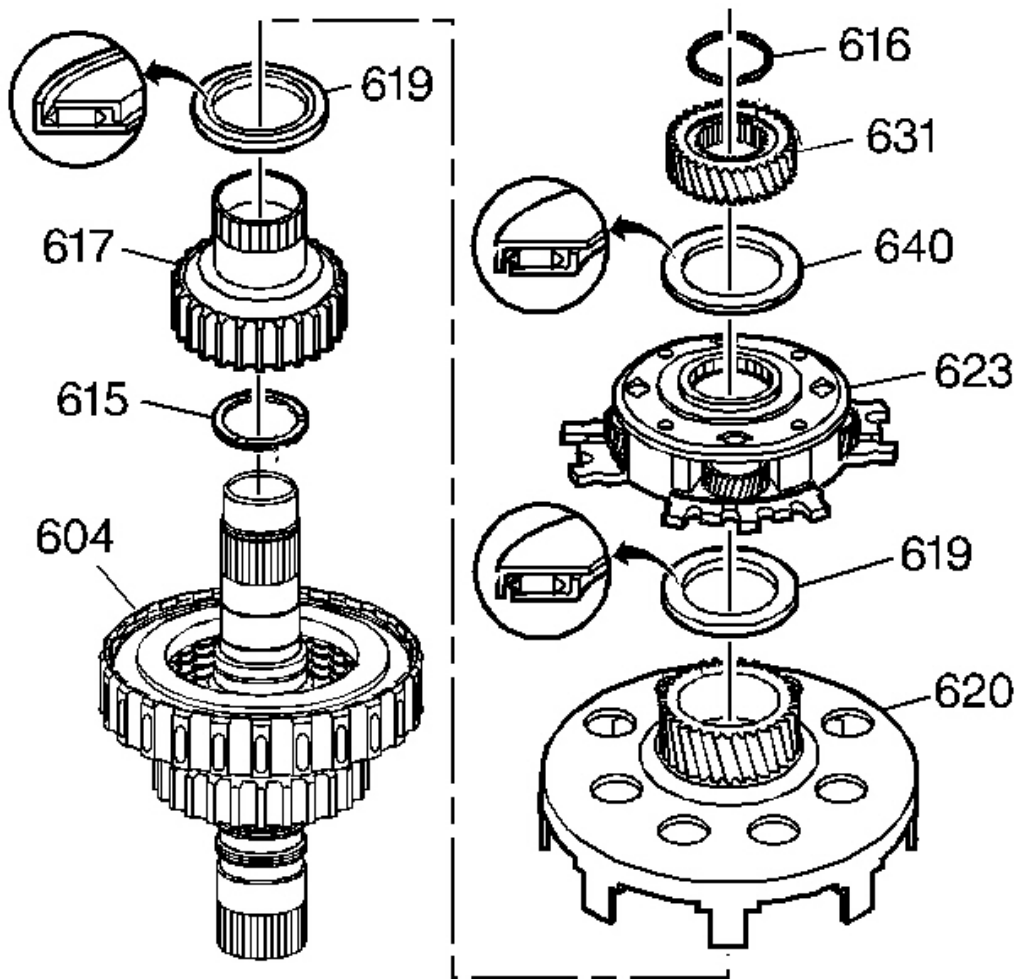


Fig. 129: Identifying Reaction Sun Gear And Shell Assembly, Reaction Carrier Assembly, Third Clutch Housing & Input Sun Gear
 Courtesy of GENERAL MOTORS CORP.

2. Remove the snap ring (616) from the input shaft.
3. Remove the following parts:
 - The input sun gear (631)
 - The thrust bearing (640) and reaction carrier assembly (623). The thrust bearing will remain in the reaction carrier.
4. Remove the following parts.

- The reaction sun gear and shell assembly (620)
- The thrust bearing (619) from the 3rd clutch hub (617)
- The third clutch hub and bushing assembly (617)
- The thrust washer (615)

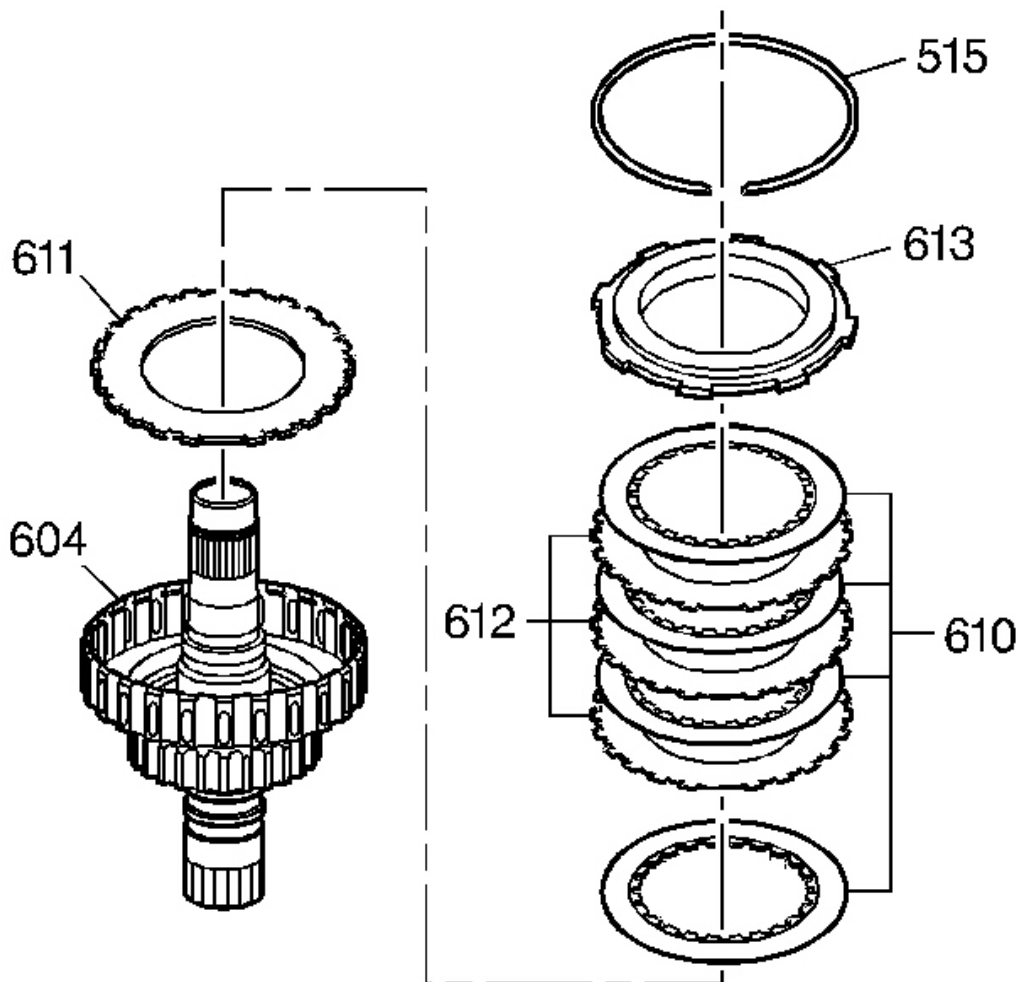


Fig. 130: View Of Third Clutch Plates
Courtesy of GENERAL MOTORS CORP.

5. Remove the snap ring (515) from the third clutch housing (604).
6. Remove the following parts:

- The third clutch backing plate (613)
- The fiber (610) and steel (612) clutch plates
- The apply plate (611)

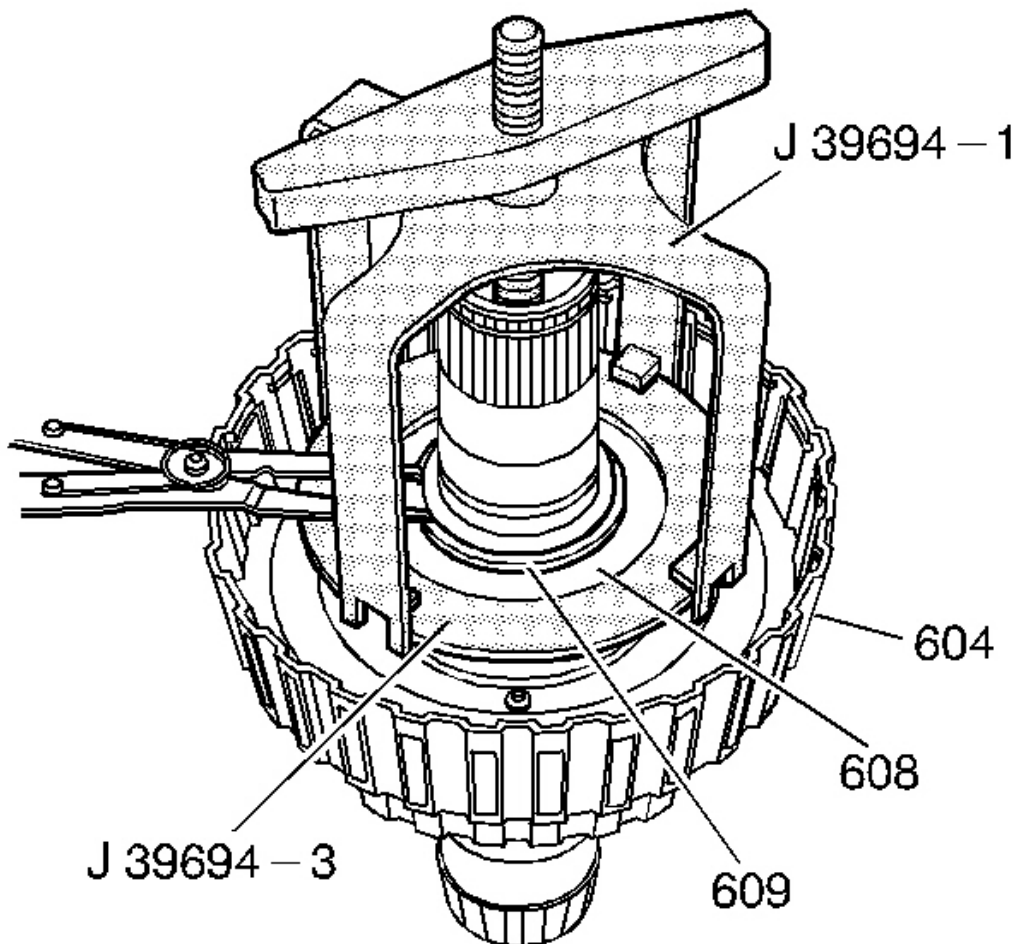


Fig. 131: Installing Clutch Spring Compressor And Compress Spring Using J 39694
Courtesy of GENERAL MOTORS CORP.

7. Install the **J 39694** clutch spring compressor and compress the spring. See **Special Tools**.
8. Remove the spring assembly snap ring (609).
9. Remove the spring compressor tool.

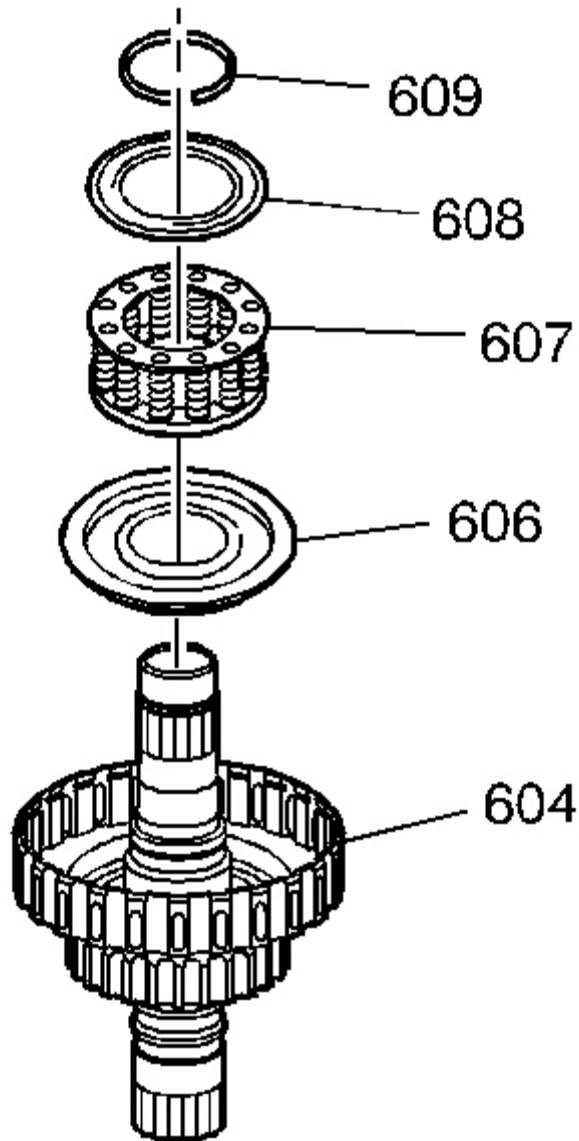


Fig. 132: Locating 3rd Clutch Piston Assembly
Courtesy of GENERAL MOTORS CORP.

10. Remove the following parts:
 - The snap ring retainer (608)

- The spring and retainer assembly (607)
- The piston assembly (606)

THIRD CLUTCH AND REACTION CARRIER ASSEMBLE

Tools Required

- **J 39694** Clutch Compressor. See **Special Tools**.
- **J 34741-1** Input Shaft Seal Protector
- **J 34741-2** Input Shaft Seal Pusher
- **J 34741-3** Input Shaft Seal Sizer
- **J 36850** Assembly Lubricant (or equivalent)

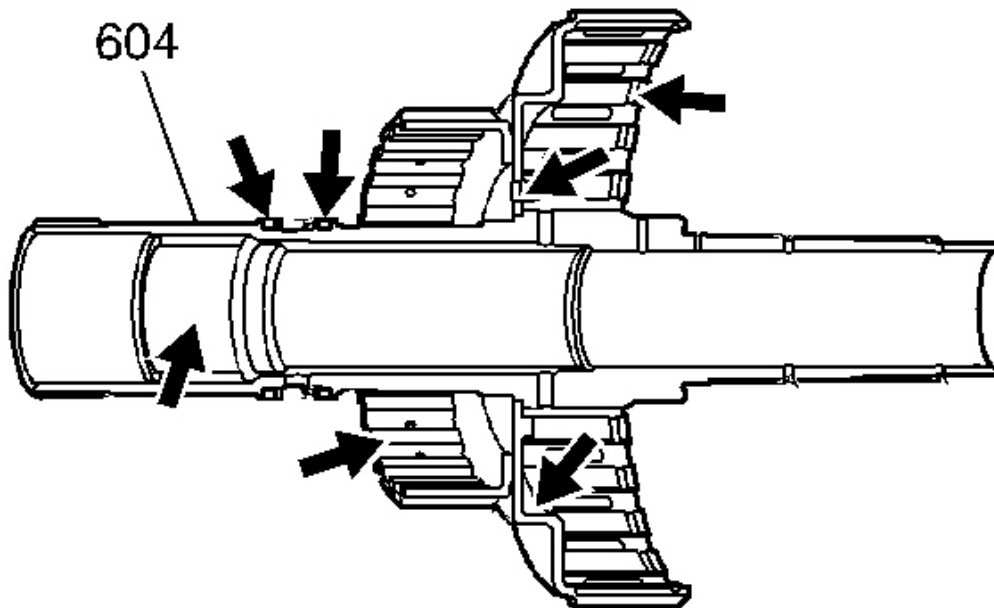


Fig. 133: Identifying 3rd Clutch Housing Inspection Points
Courtesy of GENERAL MOTORS CORP.

1. Inspect the 3rd clutch housing (604) for the following:
 - Plugged feed holes

- Seal ring grooves for nicks or burrs
- Input shaft for cracked or blocked fluid passages
- Input shaft bushing for excessive wear

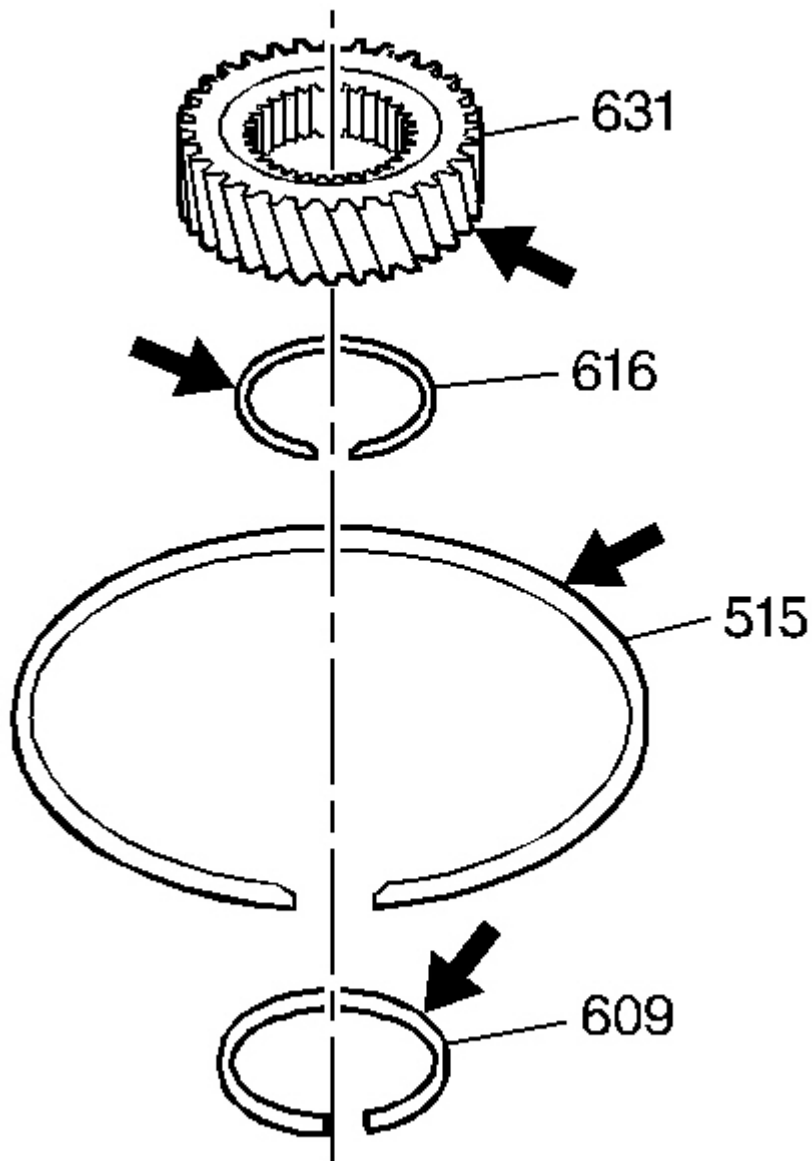


Fig. 134: View Of Input Sun Gear & Snap Rings

Courtesy of GENERAL MOTORS CORP.

2. Inspect the input sun gear (631) for damage or wear.
3. Inspect the snap rings (616, 515, 609) for overexpansion.

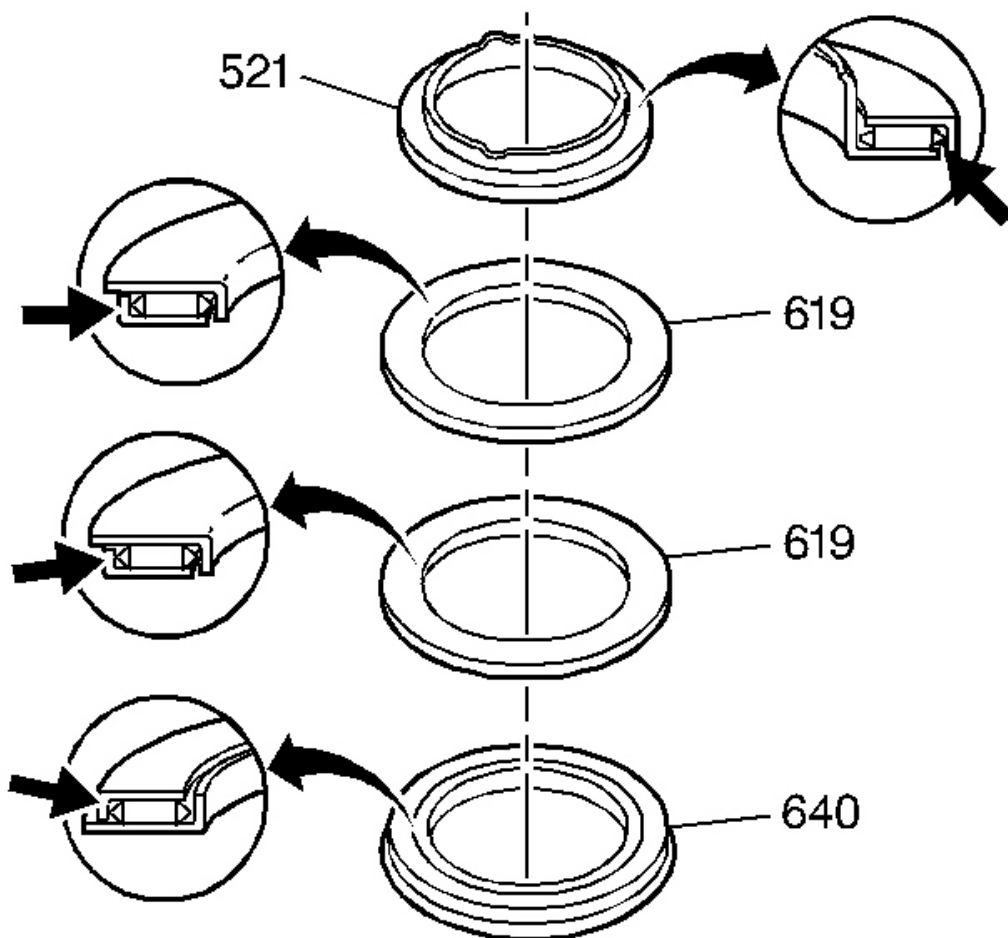


Fig. 135: Inspecting Thrust Bearing For Damage Or Wear
Courtesy of GENERAL MOTORS CORP.

4. Inspect the thrust bearings (521, 619, 640) for damage or wear.

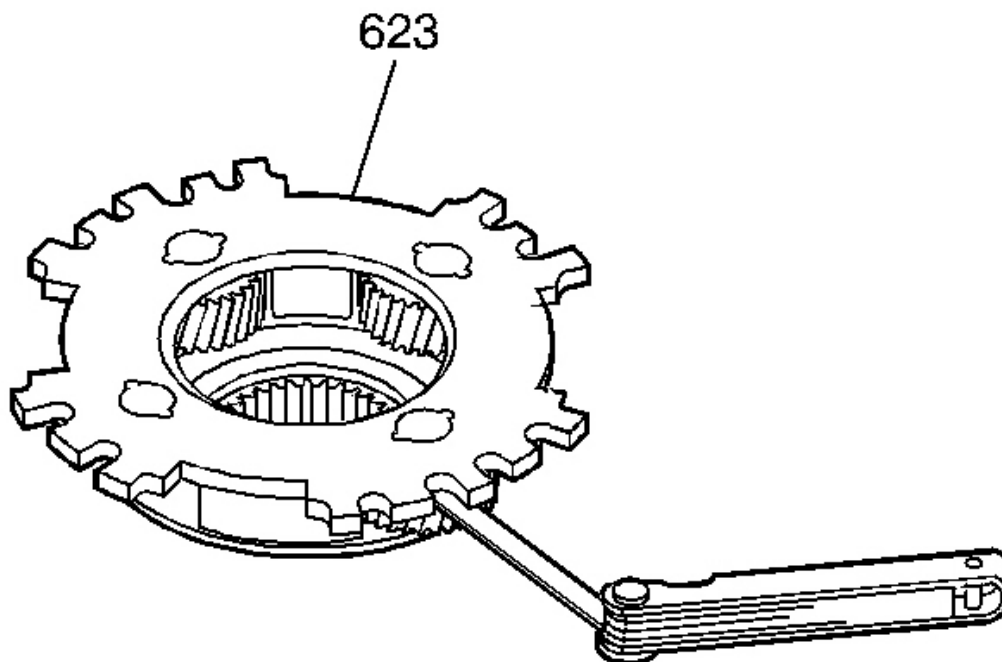


Fig. 136: Measuring Planet Pinion End Play With Feeler Gage
Courtesy of GENERAL MOTORS CORP.

5. Inspect the reaction carrier planet pinions (623) for wear. Inspect the planet pinion end play with a feeler gauge.

Specification: Pinion gear end play is 0.09-0.90 mm (0.0035-0.035 in).

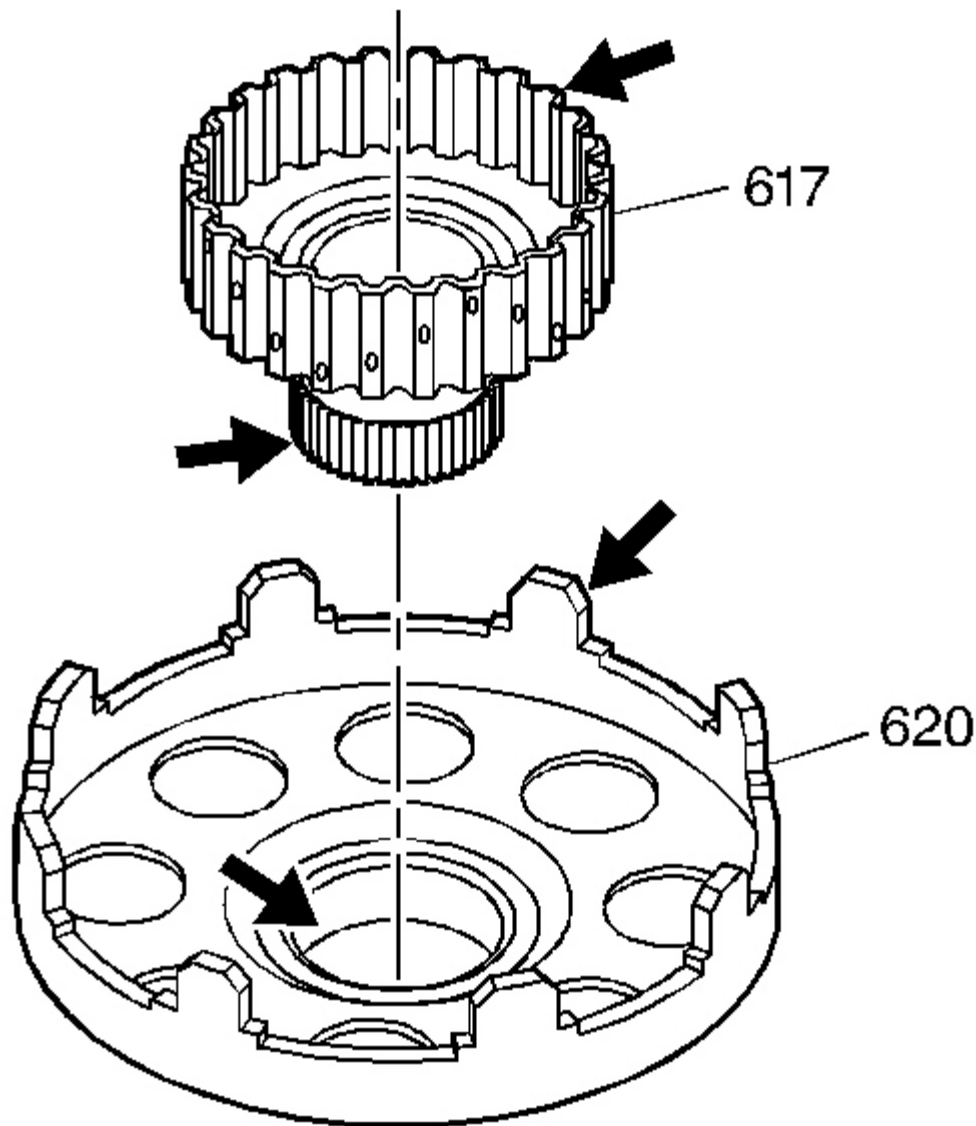


Fig. 137: Locating Reaction Sun Gear And Shell Assembly
Courtesy of GENERAL MOTORS CORP.

6. Inspect the reaction sun gear and shell assembly (620) for damage.
7. Inspect the bushing on the reaction sun gear and shell assembly (620) for wear.
8. Inspect the splines on the third clutch hub (617) for damage.

9. Check for plugged oil feed holes.

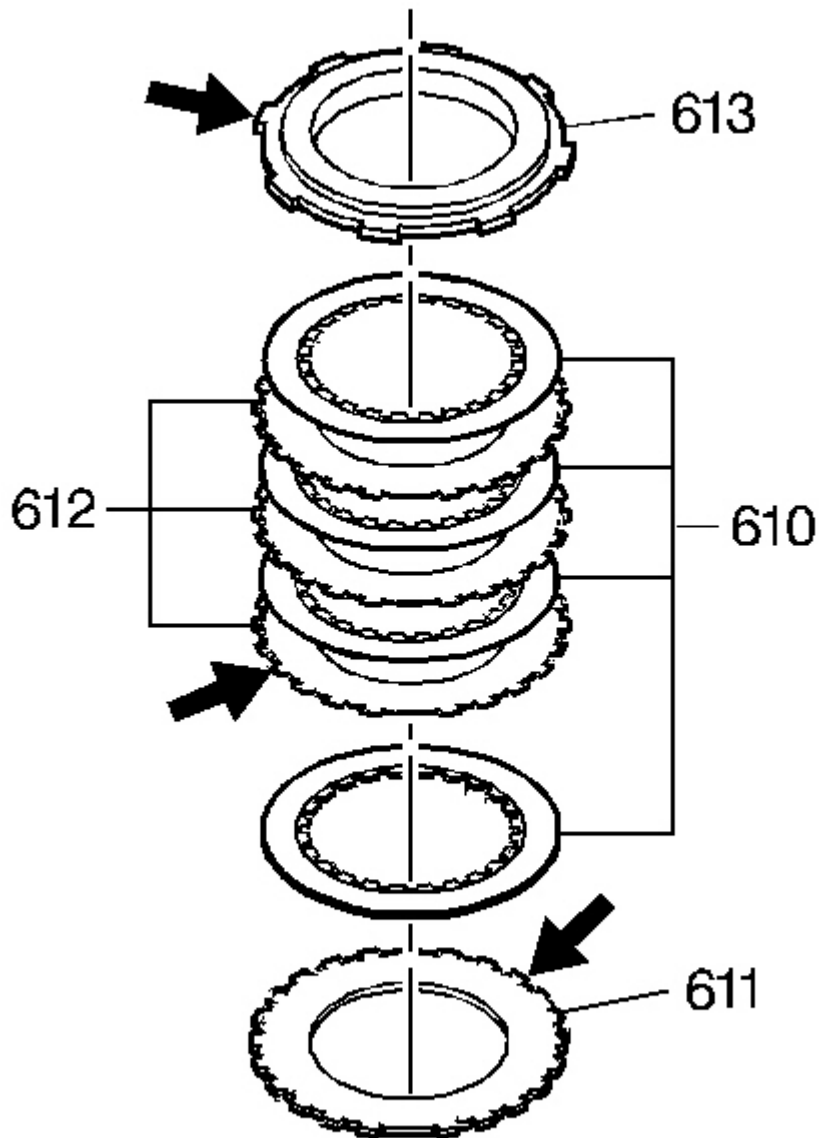


Fig. 138: View Of Inspection Areas On 3rd Clutch Plates
Courtesy of GENERAL MOTORS CORP.

10. Inspect the third clutch backing plate (613) for damage.

11. Inspect all third clutch steel plates (612) for scoring.
12. Inspect the third clutch apply plate (611) for scoring.
13. Replace all fiber plates (610).

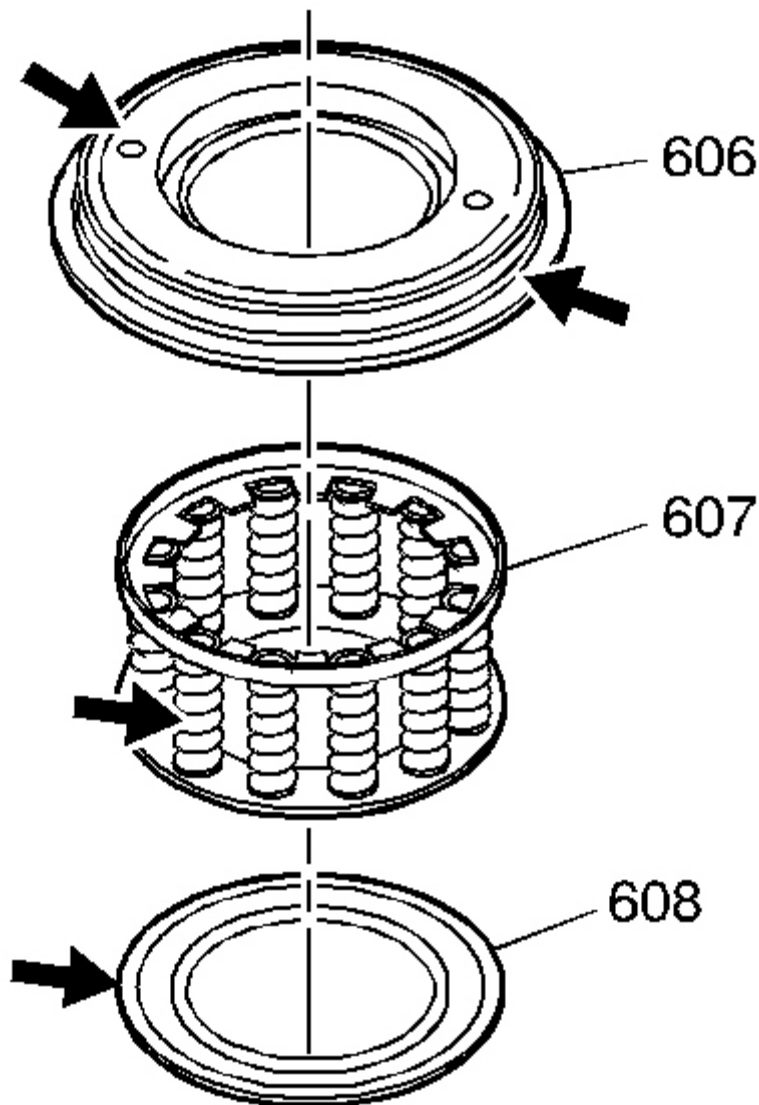


Fig. 139: Inspection Areas On Third Clutch Piston Assembly Seals
Courtesy of GENERAL MOTORS CORP.

14. Inspect the seals of the third clutch piston assembly (606). Inspect the checkball orifices. The checkball should move freely in the capsule. If the seals or checkballs are damaged, replace the third clutch piston assembly (606).
15. Inspect the return spring and retainer assembly (607) for missing or broken springs.
16. Inspect the snap ring retainer (608) for damage.

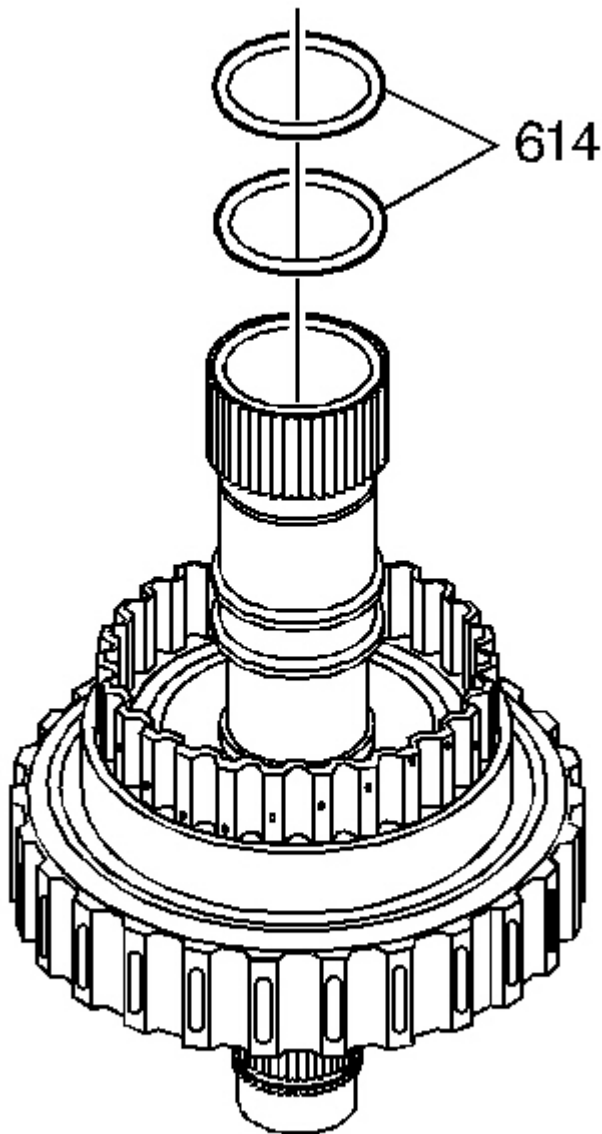


Fig. 140: Removing Oil Seal Rings
Courtesy of GENERAL MOTORS CORP.

17. Cut the oil seal rings (614) and remove the rings from the input shaft.

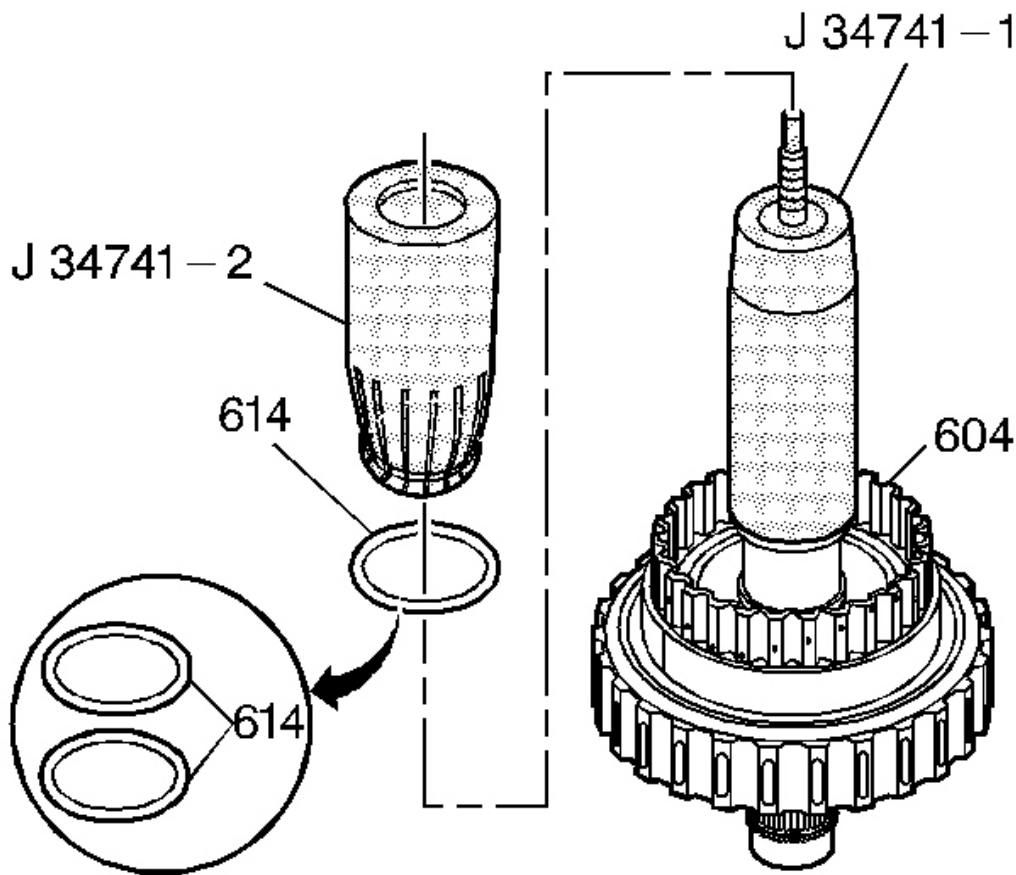


Fig. 141: Installing Oil Seal Rings Using J 34741-1
Courtesy of GENERAL MOTORS CORP.

18. Install the **J 34741-1** over the input shaft. Adjust the tool so that the bottom of the **J 34741-1** matches the correct oil seal ring groove.
19. Lubricate the oil seal ring (614) with transmission fluid, and position the ring on the **J 34741-1**.
20. Using the **J 34741-2**, quickly slide the oil seal ring (614) into the oil seal ring groove.

21. Readjust the **J 34741-1** to the second oil seal ring groove.
22. Lubricate the second oil seal ring (614) with transmission fluid, and position the ring on the **J 34741-1**.
23. Using the **J 34741-2**, quickly slide the oil seal ring (614) into the oil seal ring groove.

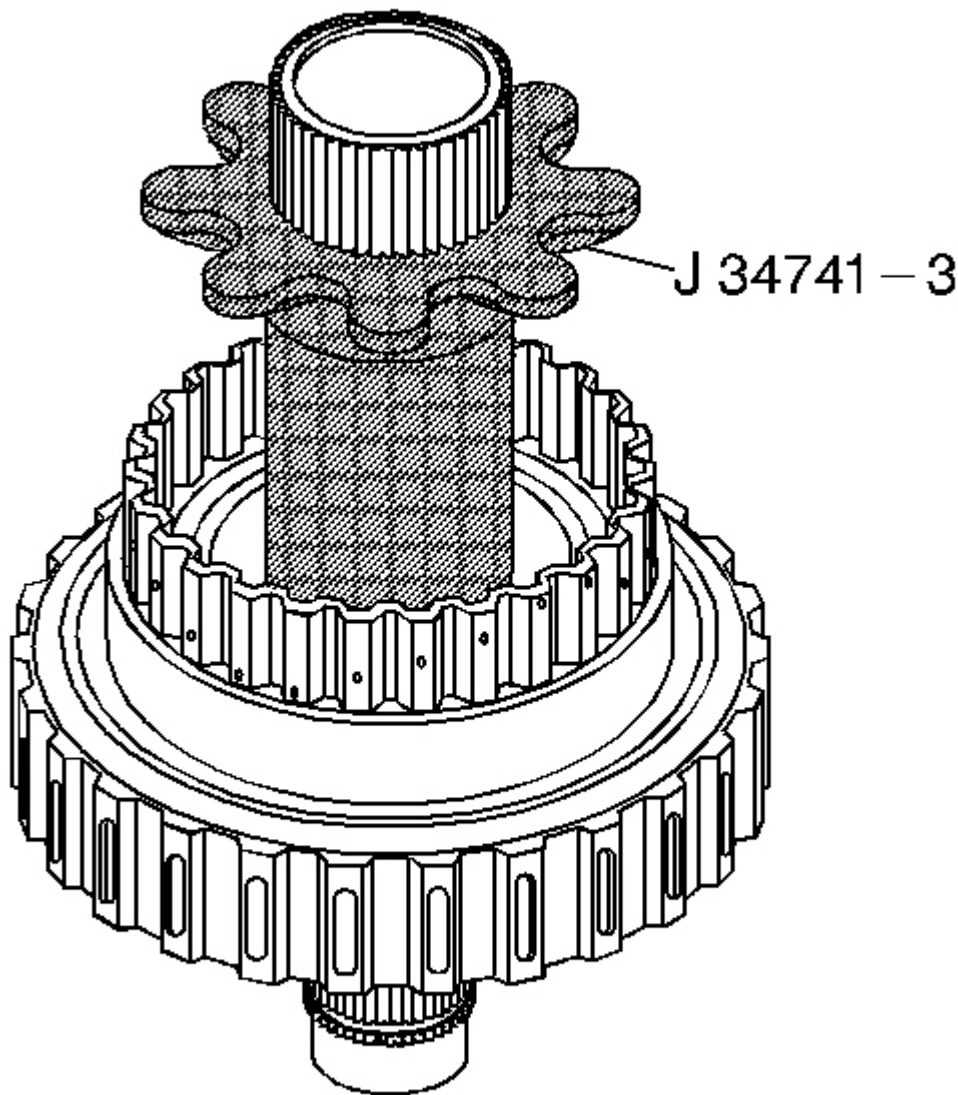


Fig. 142: Sizing The Oil Seal Rings Using J 34741-3

Courtesy of GENERAL MOTORS CORP.

24. Size the oil seal rings with the **J 34741-3** .
25. Leave the **J 34741-3** in place for at least five minutes.
26. Remove the **J 34741-3** .

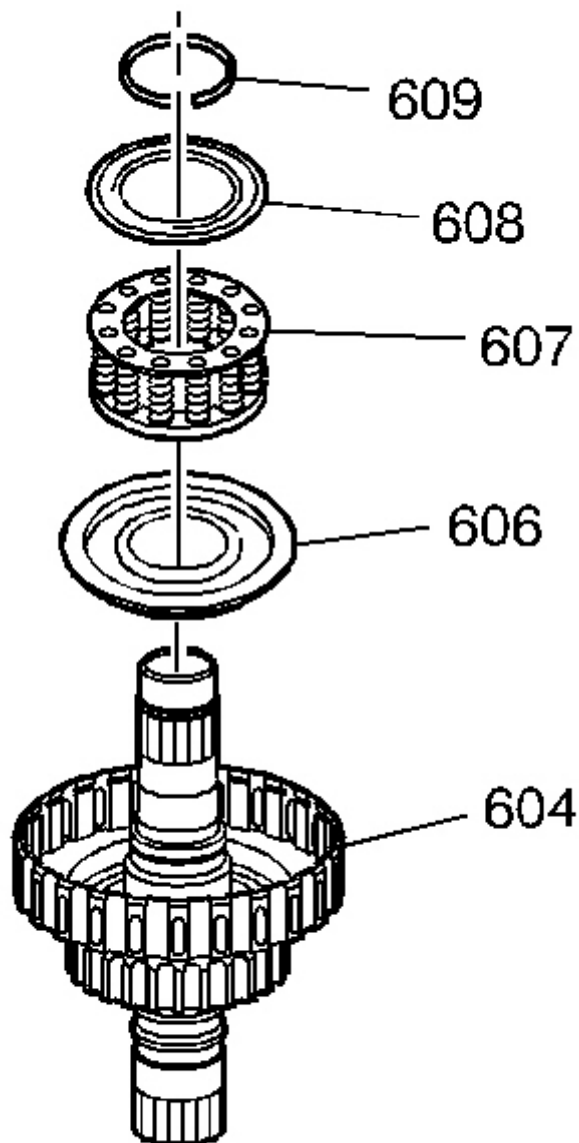


Fig. 143: Locating 3rd Clutch Piston Assembly
Courtesy of GENERAL MOTORS CORP.

27. Lubricate the 3rd clutch piston seals with a light coating of **J 36850** or equivalent.
28. Install the 3rd clutch piston assembly (606) into the bottom side of the 3rd clutch housing (604). Use a twisting motion when pushing the piston into the housing.
29. Install the spring and retainer assembly (607), and install the snap ring retainer (608).

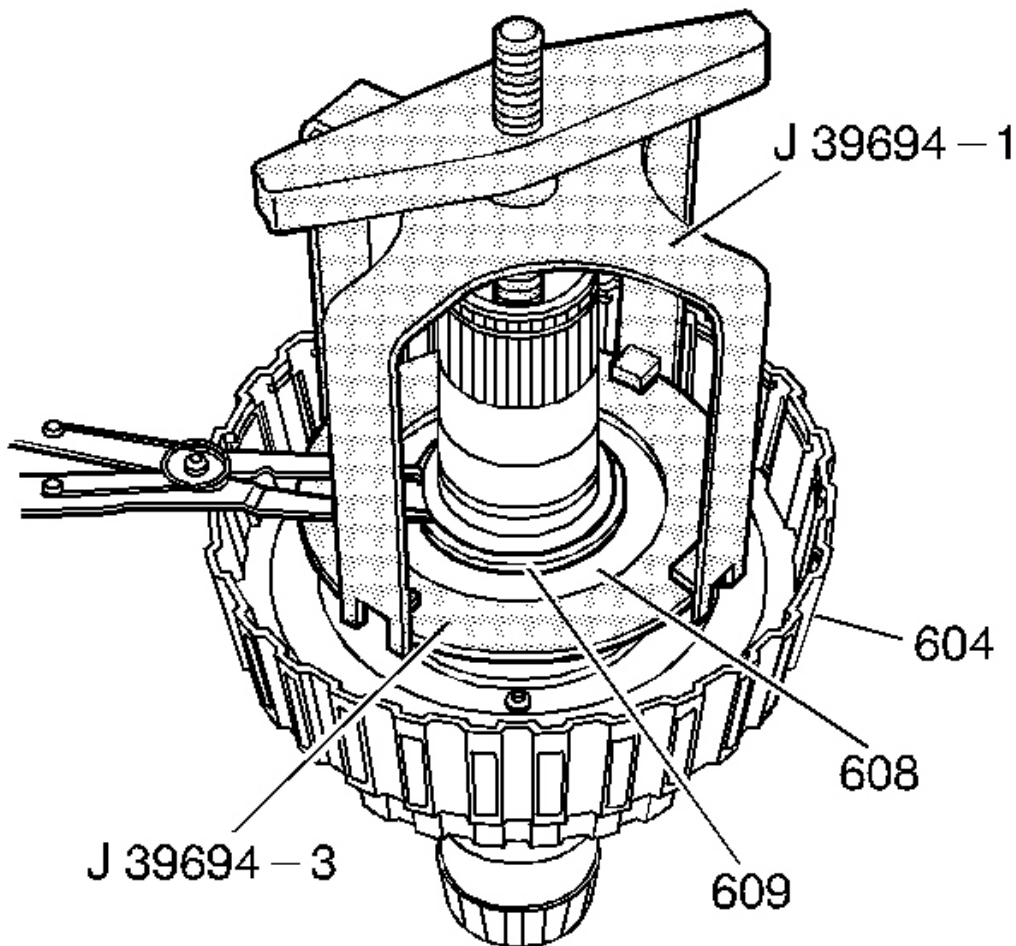


Fig. 144: Installing Clutch Spring Compressor And Compress The Spring Using J 39694
Courtesy of GENERAL MOTORS CORP.

30. Install the **J 39694** -1 and the **J 39694** -3 and compress the spring and retainer assembly. See **Special Tools**.
31. Install the snap ring (609).
32. Remove the **J 39694** -1 and the **J 39694** -3. See **Special Tools**.

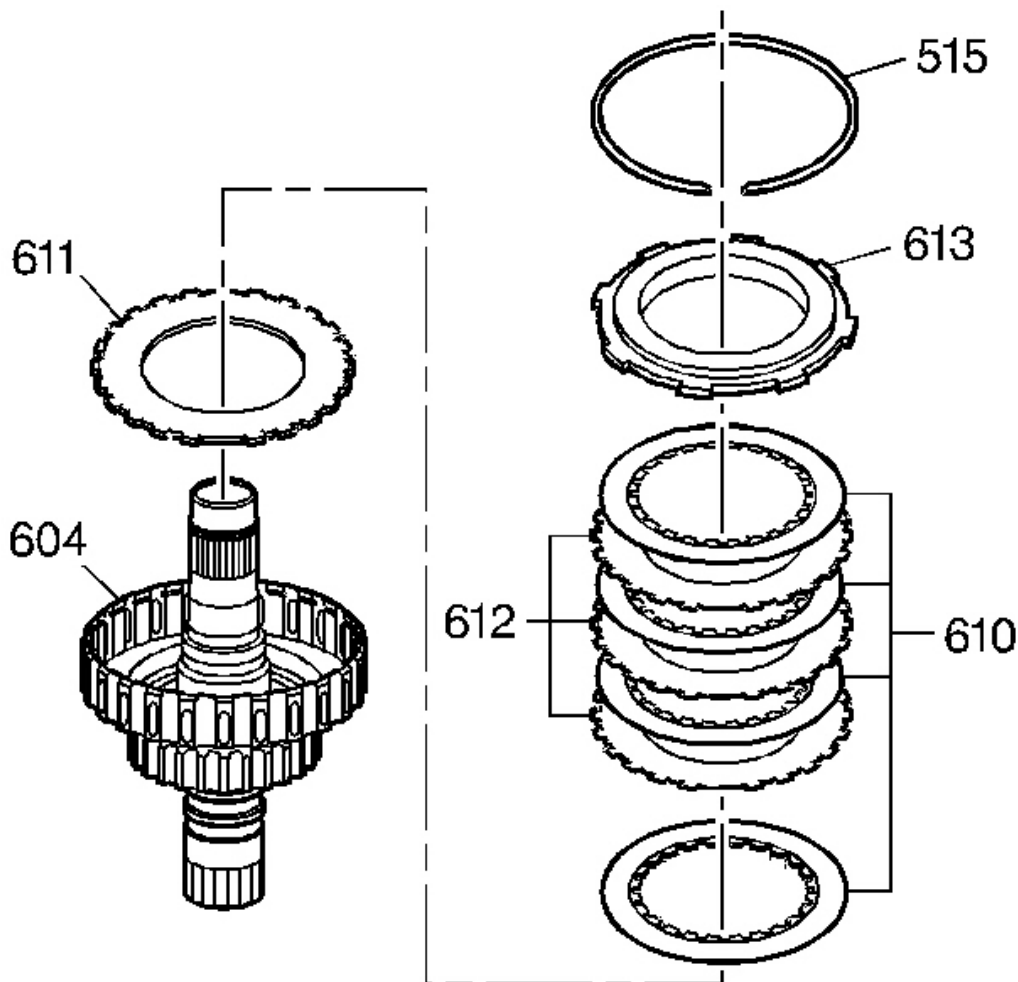


Fig. 145: View Of Third Clutch Plates
Courtesy of GENERAL MOTORS CORP.

33. Install the following parts:
 - The apply plate (611)

- The four fiber clutch plates (610)
- The three steel clutch plates (612)

IMPORTANT: The backing plate (613) must be installed with the stepped side up.

34. Install the backing plate (613).

35. Install the snap ring (515).

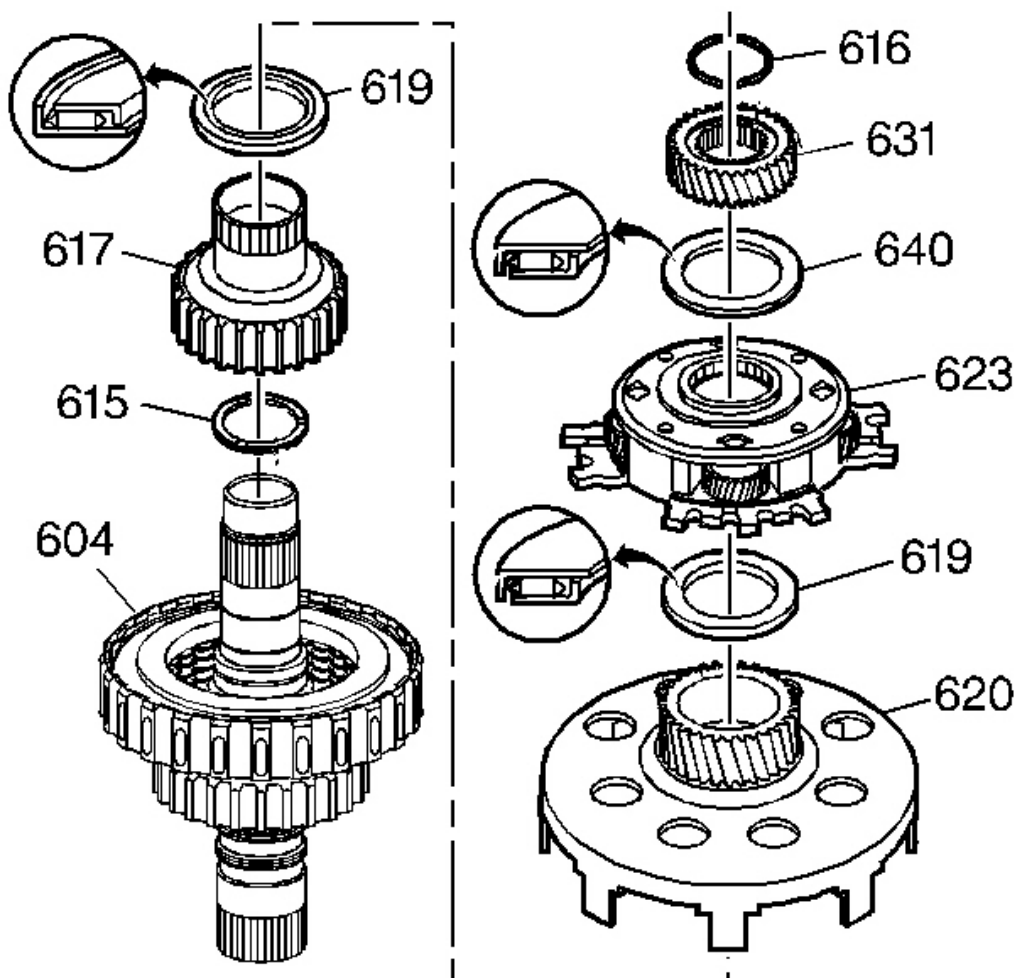


Fig. 146: Identifying Reaction Sun Gear And Shell Assembly, Reaction Carrier

Assembly, Third Clutch Housing & Input Sun Gear
Courtesy of GENERAL MOTORS CORP.

36. Install the following parts:

- The thrust washer (615)
- The third clutch hub and bushing assembly (617)

IMPORTANT: Make sure that the rolled inner lip of the thrust bearing (619) is facing toward the clutch pack.

- The thrust bearing (619).

37. Install the reaction sun gear and shell assembly (620). If the thrust bearing (619) was removed, install this bearing inside the reaction carrier assembly (623).

38. Install the reaction carrier assembly (623).

IMPORTANT: Make sure that the thrust bearing (640) is installed with the black surface toward the clutch pack.

39. Install the thrust bearing (640).

40. Install the input sun gear (631). The sun gear can be assembled in either direction.

41. Install the snap ring (616).

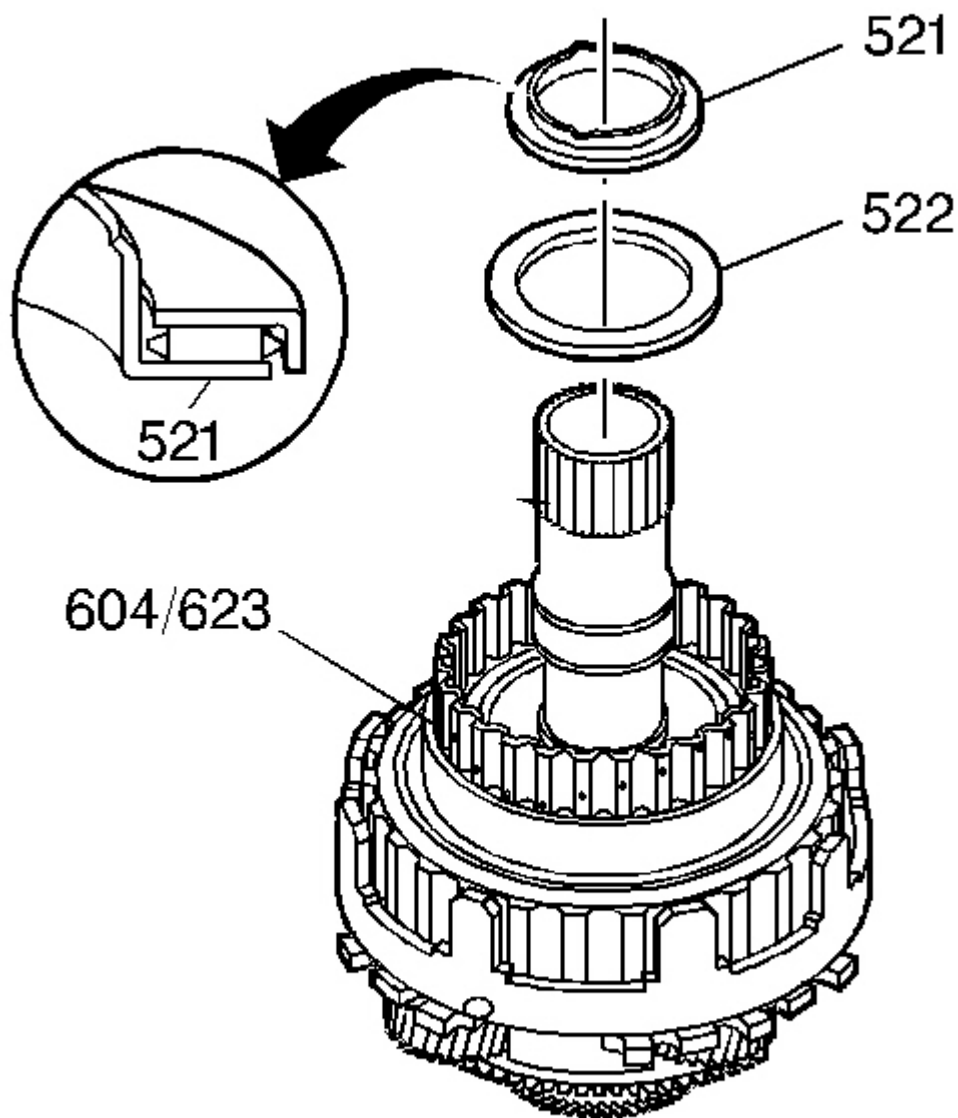


Fig. 147: Locating Selective Washer & Thrust Bearing
Courtesy of GENERAL MOTORS CORP.

42. Install the selective washer (522) and the thrust bearing (521). Secure the washer and the bearing to the top of the clutch housing with **J 36850** or equivalent.

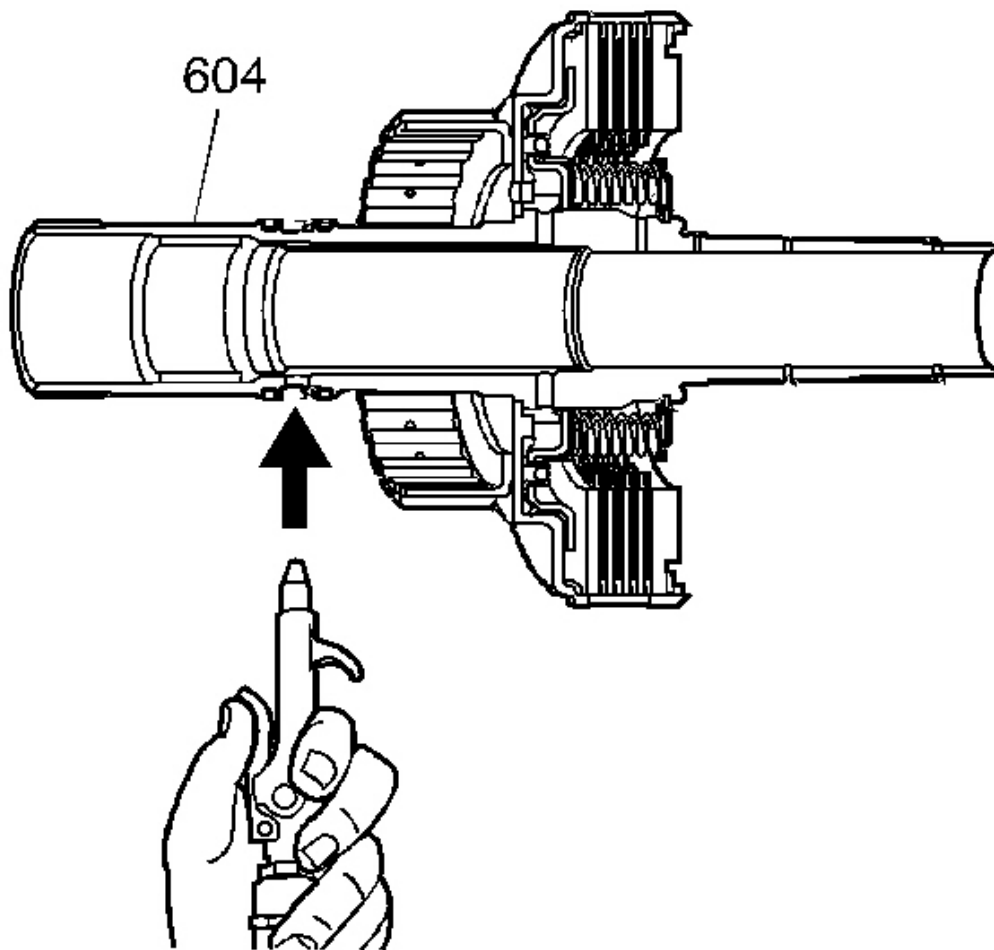


Fig. 148: Blowing Air In The Input Shaft Orifice
Courtesy of GENERAL MOTORS CORP.

43. Air check the 3rd clutch assembly by applying 50-60 psi of air to the proper orifice in the input shaft while blocking the orifice on the other side of the input shaft and 3rd clutch housing assembly (604).

REACTION CARRIER/SHELL AND THIRD CLUTCH INSTALLATION

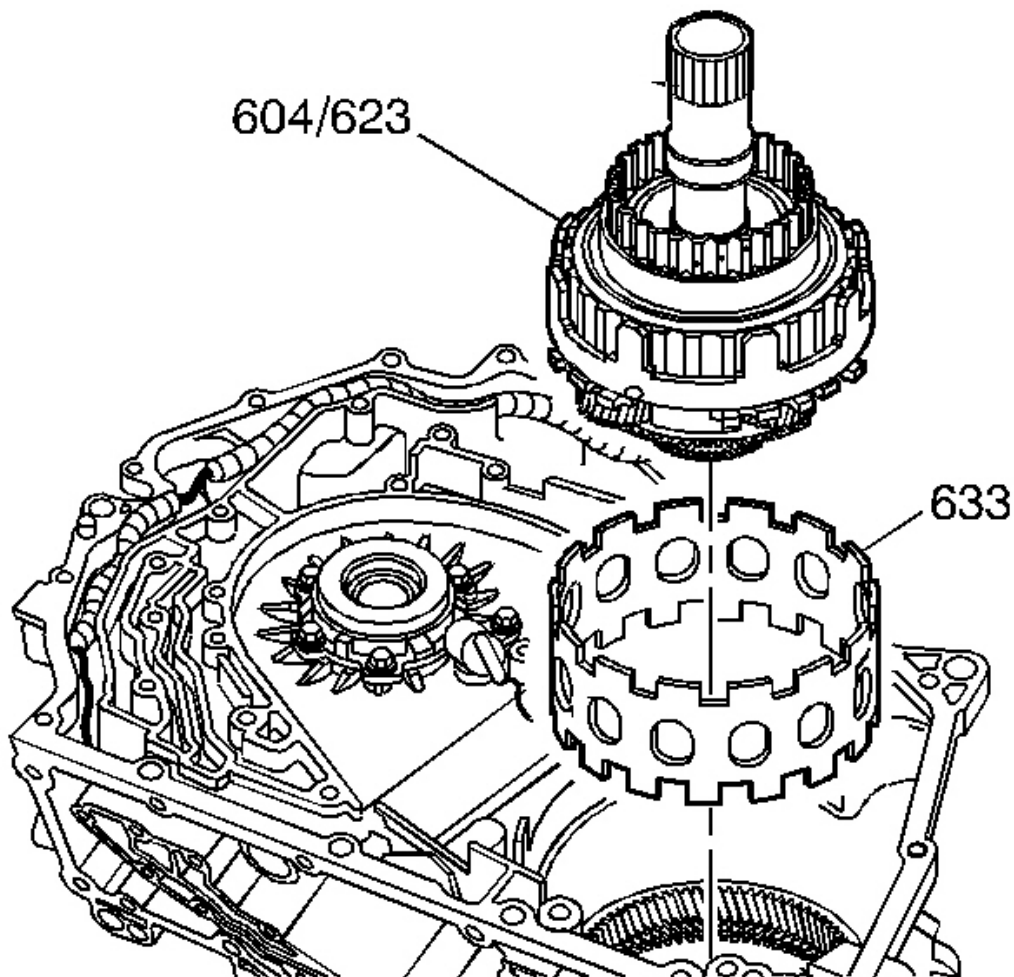


Fig. 149: View Of Reaction Carrier/Shell And Third Clutch
Courtesy of GENERAL MOTORS CORP.

1. Inspect the reaction shell (633) for damage or wear.
2. Install the reaction shell (633) into the forward clutch housing, with the small teeth facing down.

IMPORTANT: Following installation, the reaction carrier teeth must seat in the reaction shell.

3. Install the third clutch housing and reaction carrier assembly (604/623) into the case. Twist the housing to install and to insure proper seating.

FOURTH BAND INSTALLATION

Tools Required

J 34741-3 Input Shaft Seal Sizer

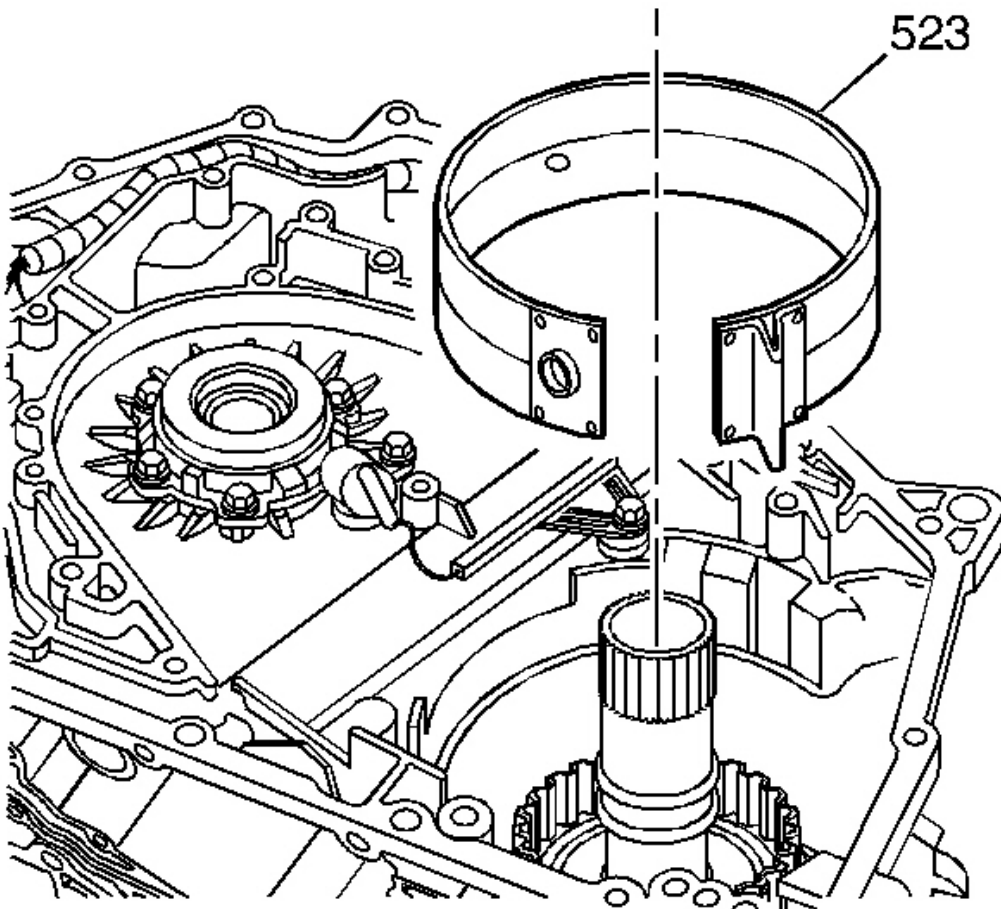


Fig. 150: Installing Fourth Band
Courtesy of GENERAL MOTORS CORP.

1. Install the fourth band (523) into the case. Seat the band properly onto the anchor pin with

the seat of the servo pin toward the servo bore in the case.

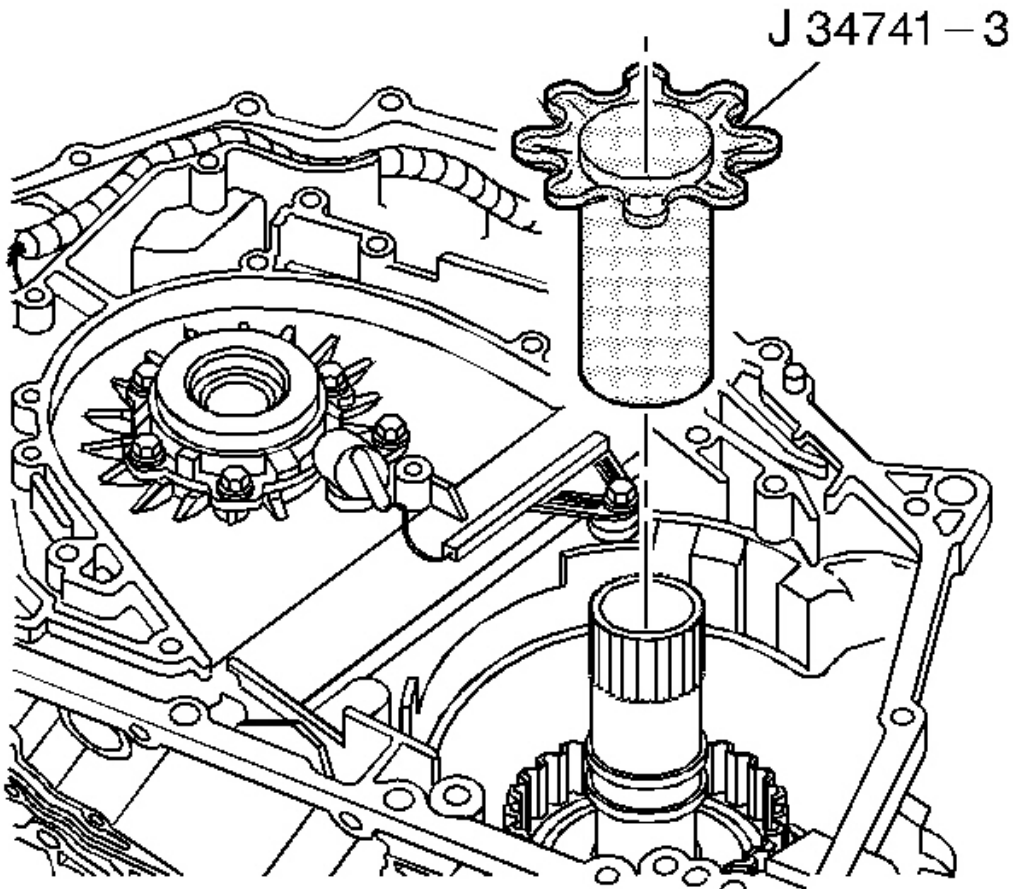


Fig. 151: Installing J 34741-3 Over The Input Shaft Oil Seal Rings
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Leave the J 34741-3 in place until the reverse clutch and housing assembly is ready to be installed.

2. Install the **J 34741-3** over the input shaft oil seal rings. Use a twisting motion to install the **J 34741-3**. The **J 34741-3** must contact the third clutch housing hub.

Tools Required

J 39694 Spring Compressor. See **Special Tools**.

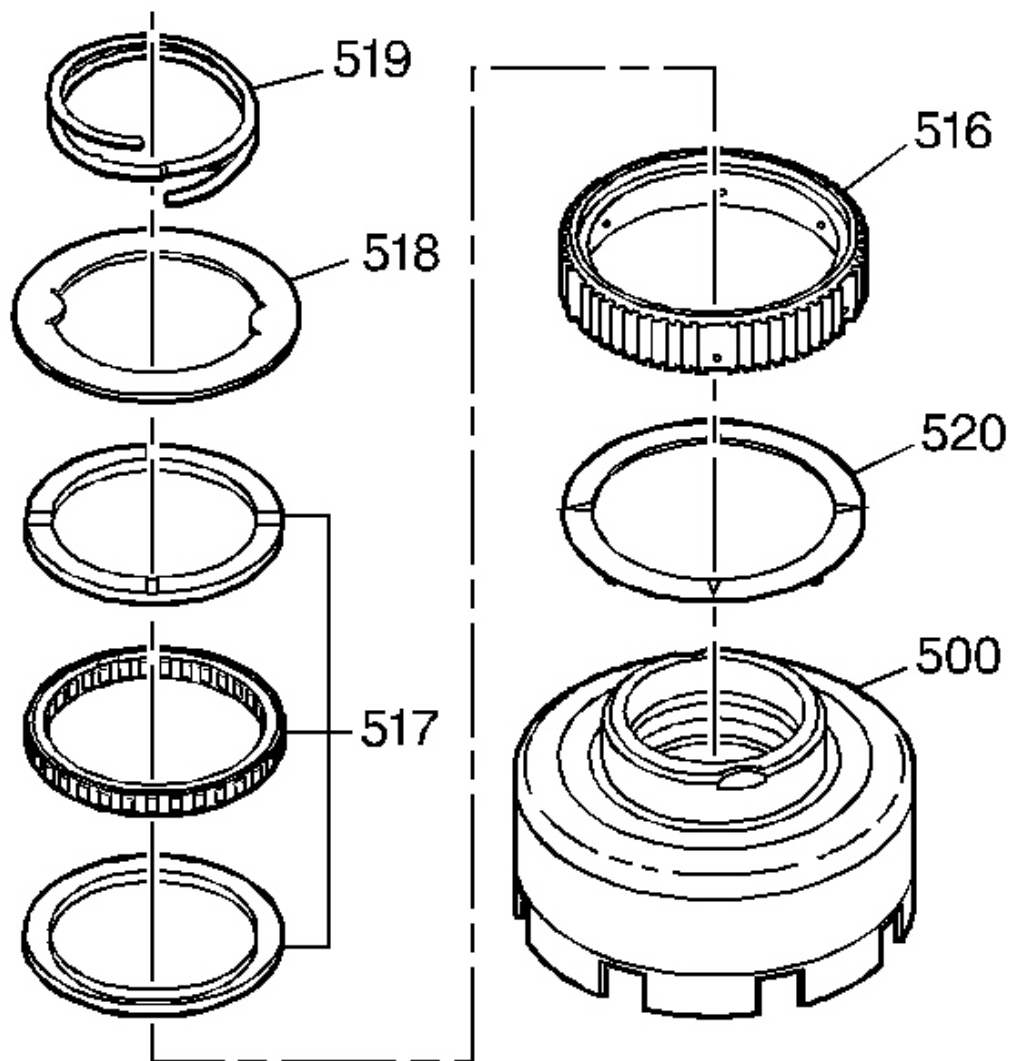


Fig. 152: Removing Second Sprag Components
Courtesy of GENERAL MOTORS CORP.

1. Remove the spiral snap ring (519). Discard the snap ring, which is not reusable.
2. Remove the following parts:

- The sprag clutch retainer (518)
- The second sprag outer race
- The second sprag clutch (516-517)
- The second sprag outer race thrust washer (520)

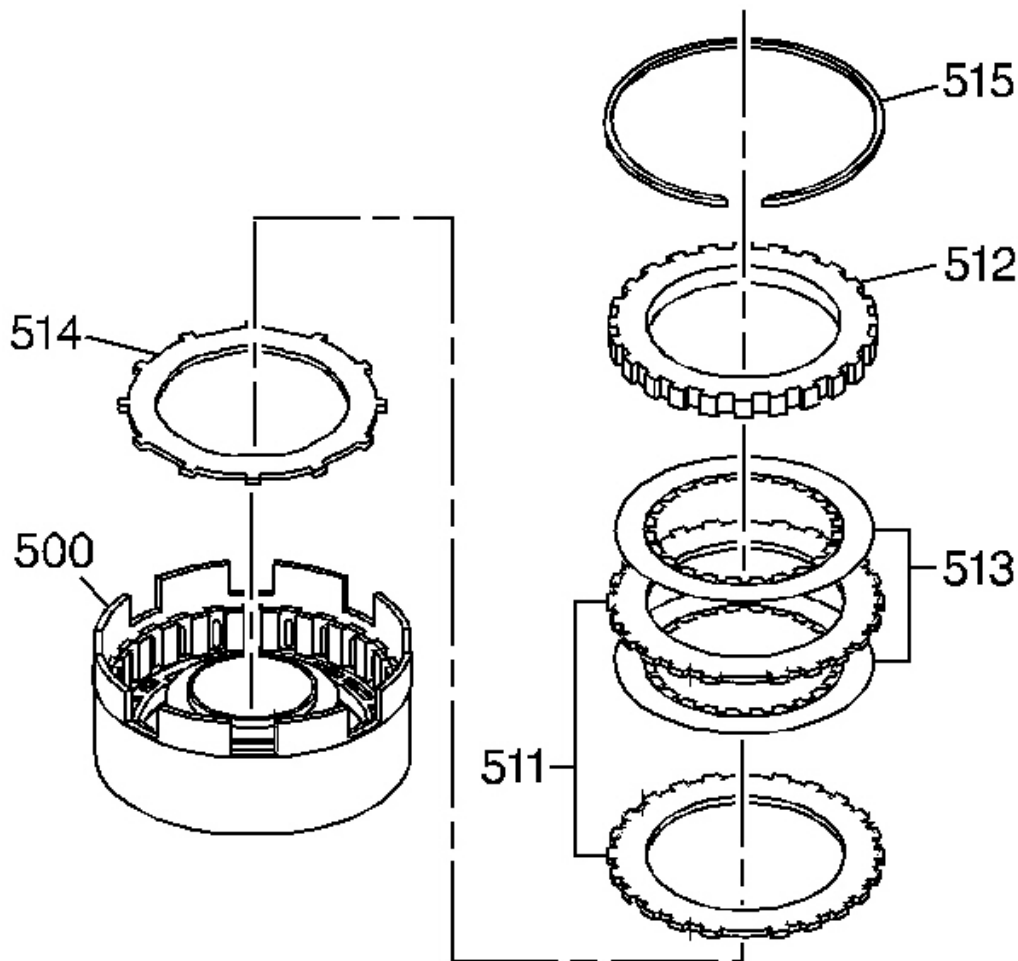


Fig. 153: View Of Reverse Clutch Plates
Courtesy of GENERAL MOTORS CORP.

3. Remove the following parts:
 - The reverse clutch snap ring (515)

- The reverse clutch backing plate (512)
- All of the fiber (513) and steel (511) clutch plates
- The reverse clutch waved plate (514)

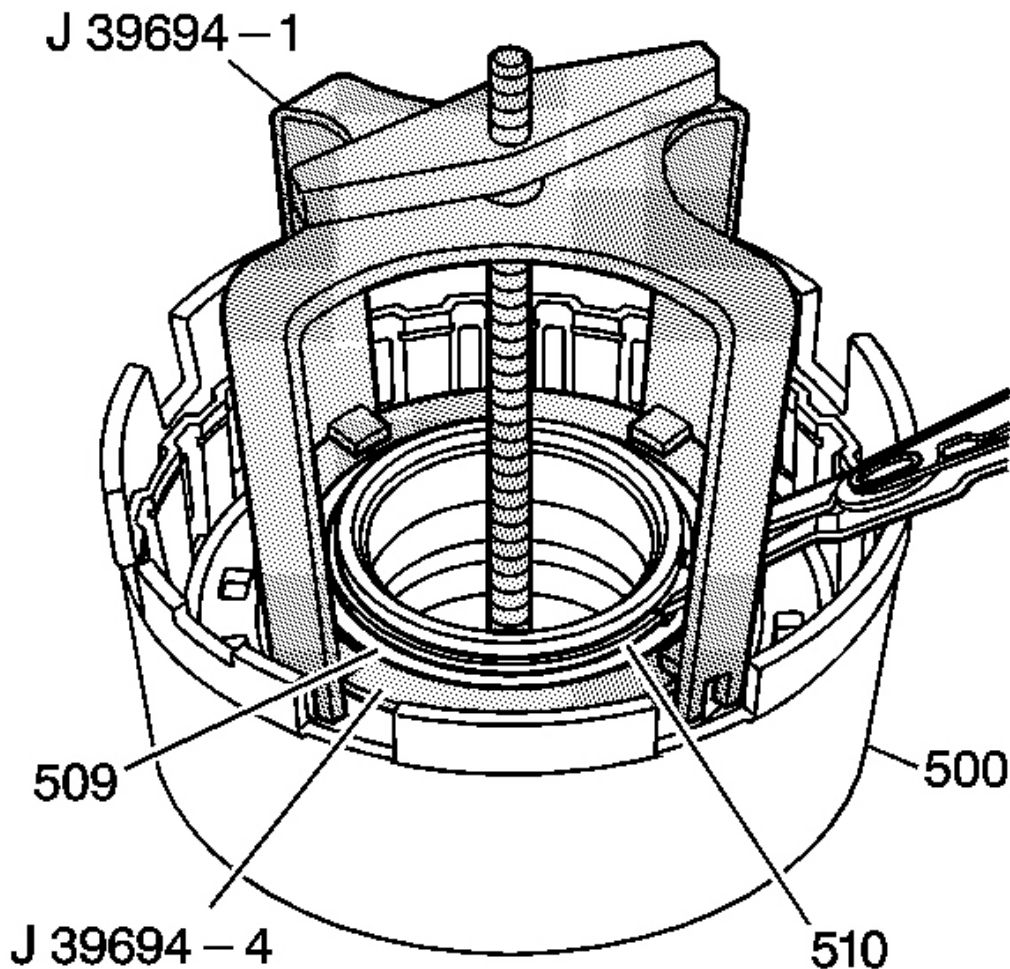


Fig. 154: Compressing The Spring And Retainer Assembly Using J 39694
Courtesy of GENERAL MOTORS CORP.

4. Install the **J 39694** spring compressor and compress the spring and retainer assembly (509). See **Special Tools**. Then remove the snap ring (510).

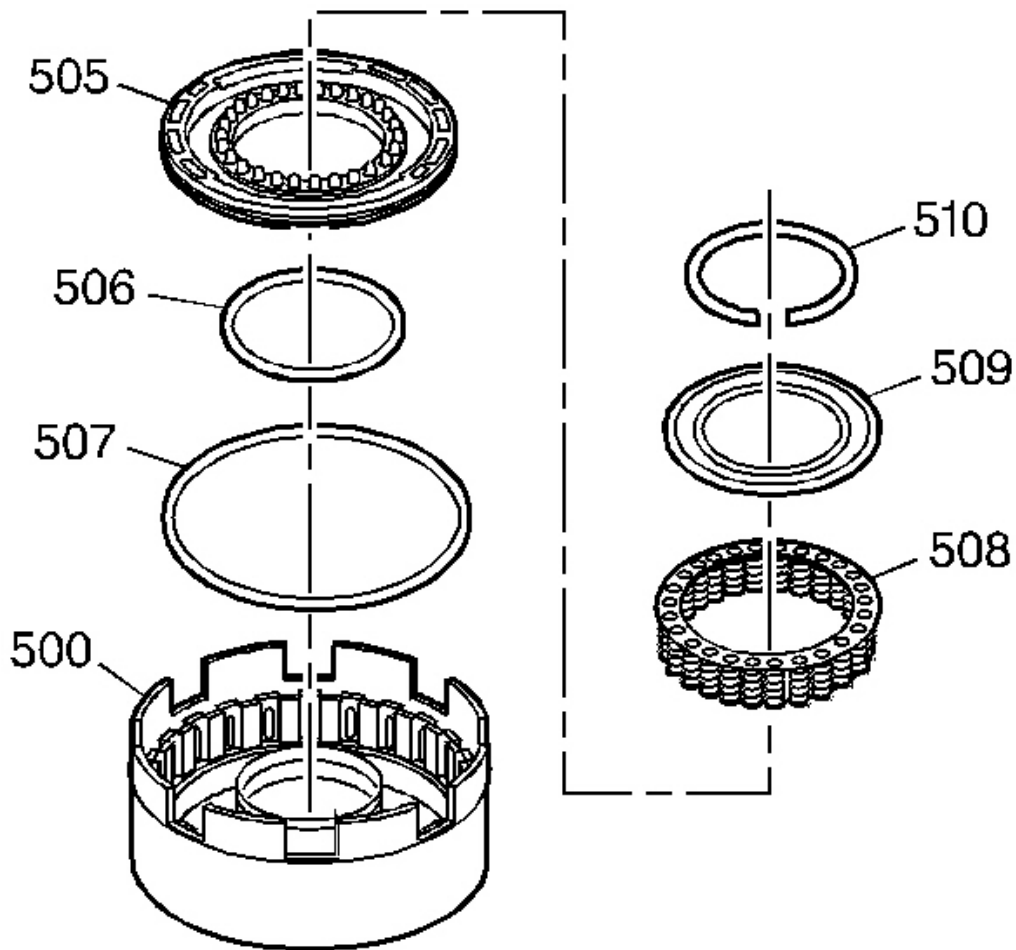


Fig. 155: Removing Spring And Retainer Assembly
 Courtesy of GENERAL MOTORS CORP.

5. Remove the following parts:

- The snap ring retainer (509)
- The spring and retainer assembly (508)
- The piston assembly (505)

REVERSE CLUTCH HOUSING AND SECOND SPRAG ASSEMBLE

Tools Required

- **J 39694** Spring Compressor. See **Special Tools**.
- **J 39054** Reverse Clutch Seal Protector. See **Special Tools**.

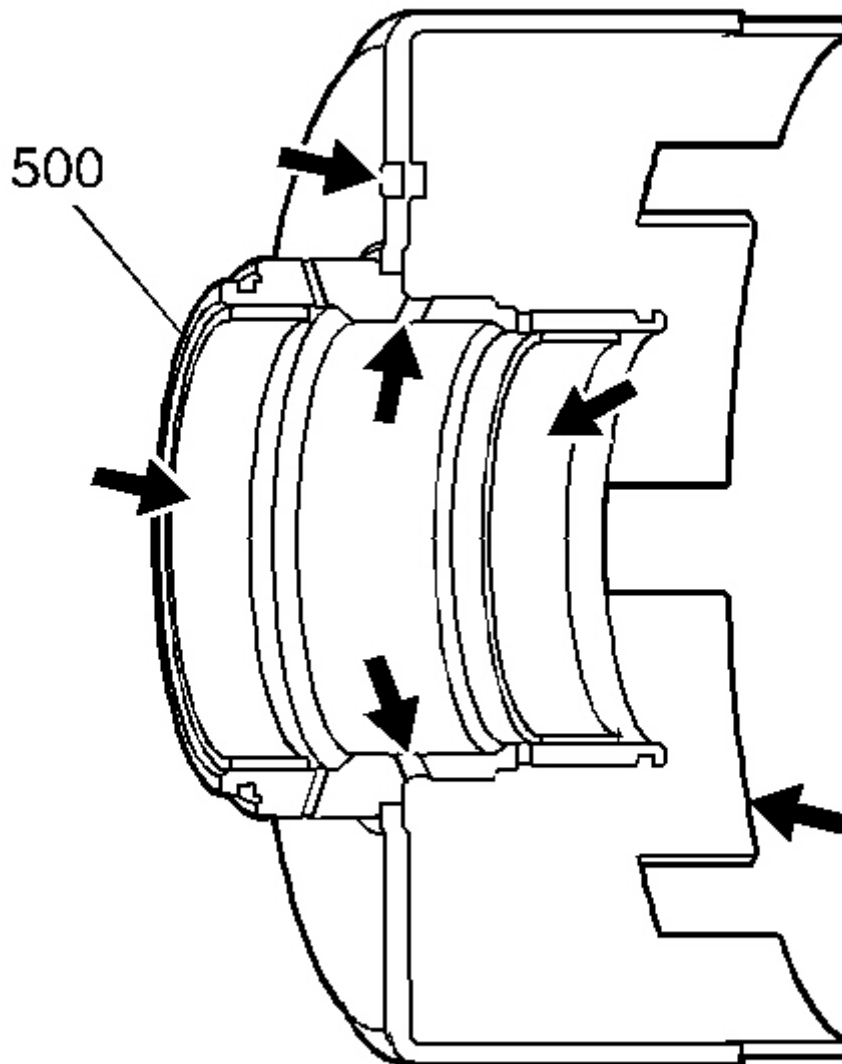


Fig. 156: Identifying Inspection Areas On Reverse Clutch Housing
Courtesy of GENERAL MOTORS CORP.

1. Inspect the reverse clutch housing (500) for the following:

- Plugged feed holes
- Snap ring for overexpansion
- Outer surface for scoring or burning
- Reverse clutch housing checkball for damage, the checkball should move freely in the capsule.

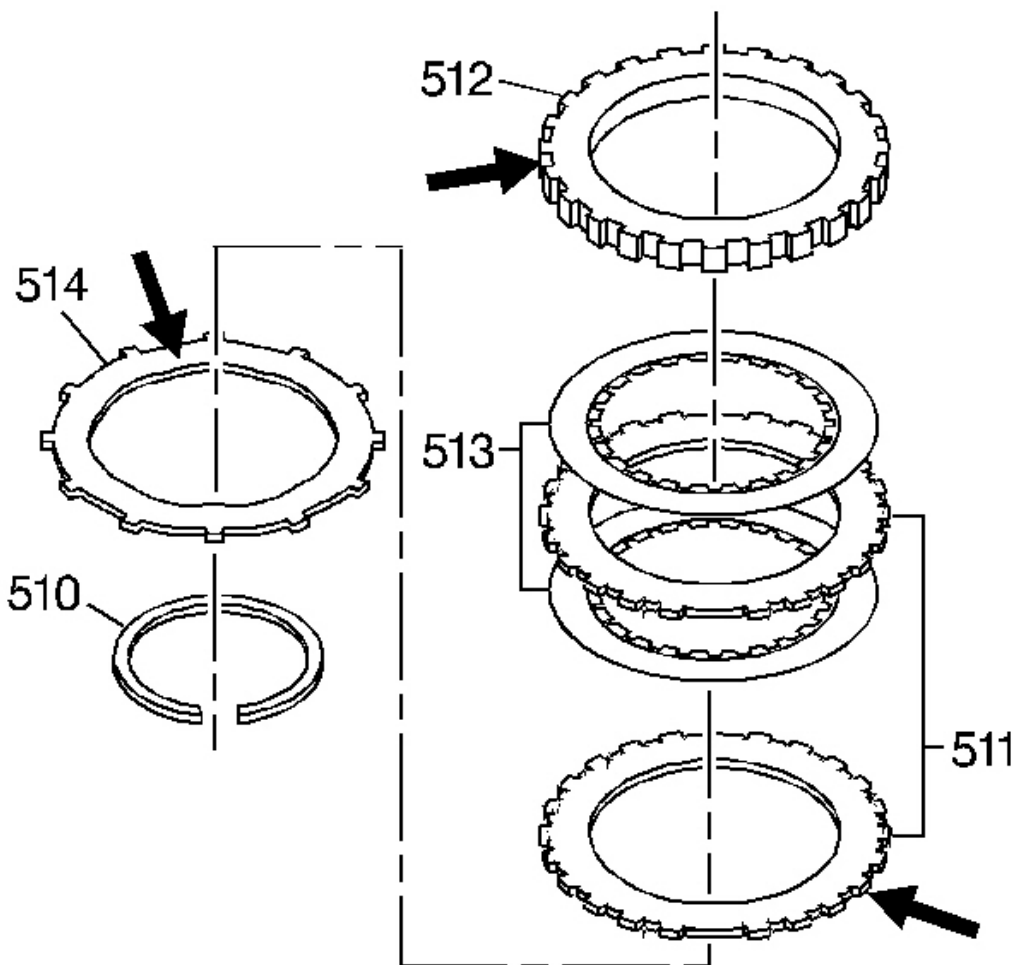


Fig. 157: View Of Reverse Plates Inspection Areas
 Courtesy of GENERAL MOTORS CORP.

2. Inspect the reverse clutch steel plates (511), the backing plate (512) and the waved plate

(514) for scoring or burning.

3. Inspect the snap ring (510) for overexpansion.
4. Replace all of the fiber clutch plate assemblies (513).

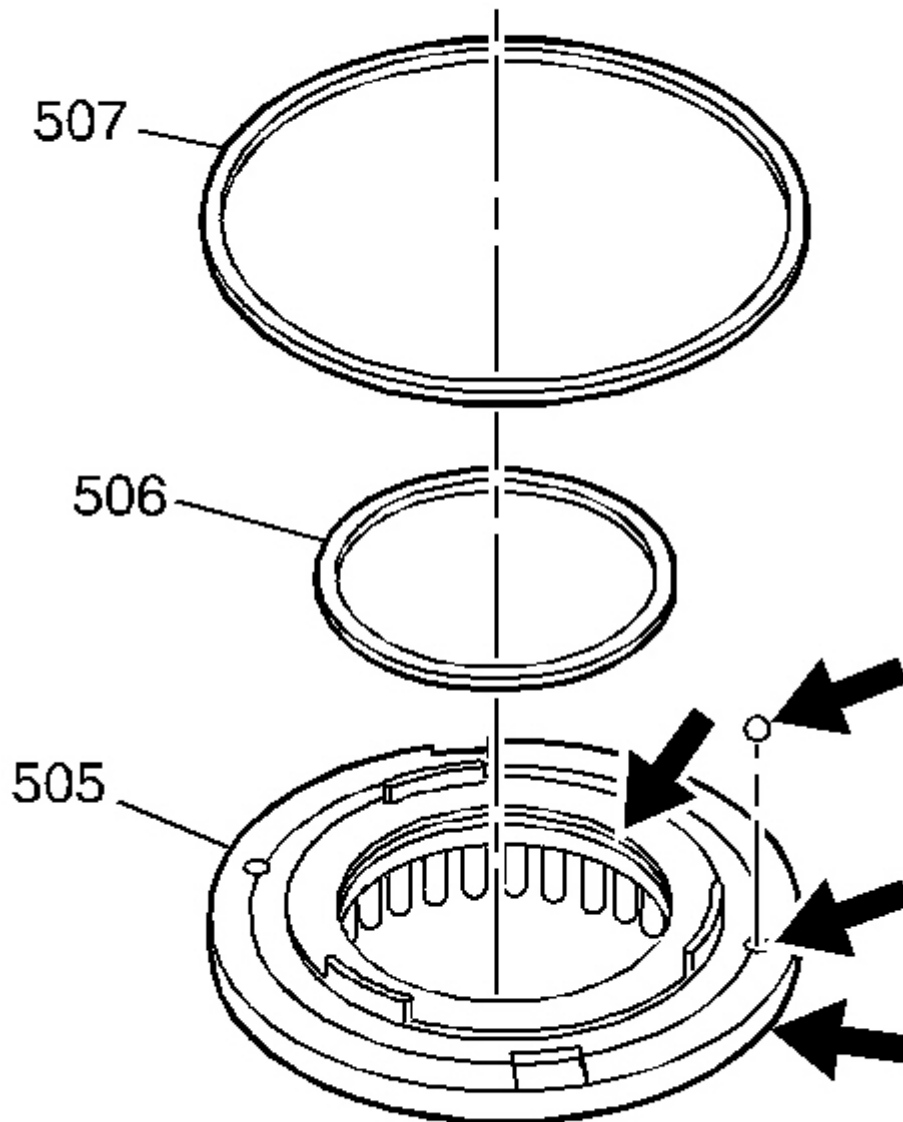


Fig. 158: Locating Reverse Clutch Piston Inner & Outer Seal Damage
Courtesy of GENERAL MOTORS CORP.

5. Inspect the reverse clutch piston inner seal (506) and outer seal (507) for damage.
6. Inspect the checkball orifices on the reverse clutch piston assembly (505) for damage caused by peening. The checkball should move freely in the piston capsule.

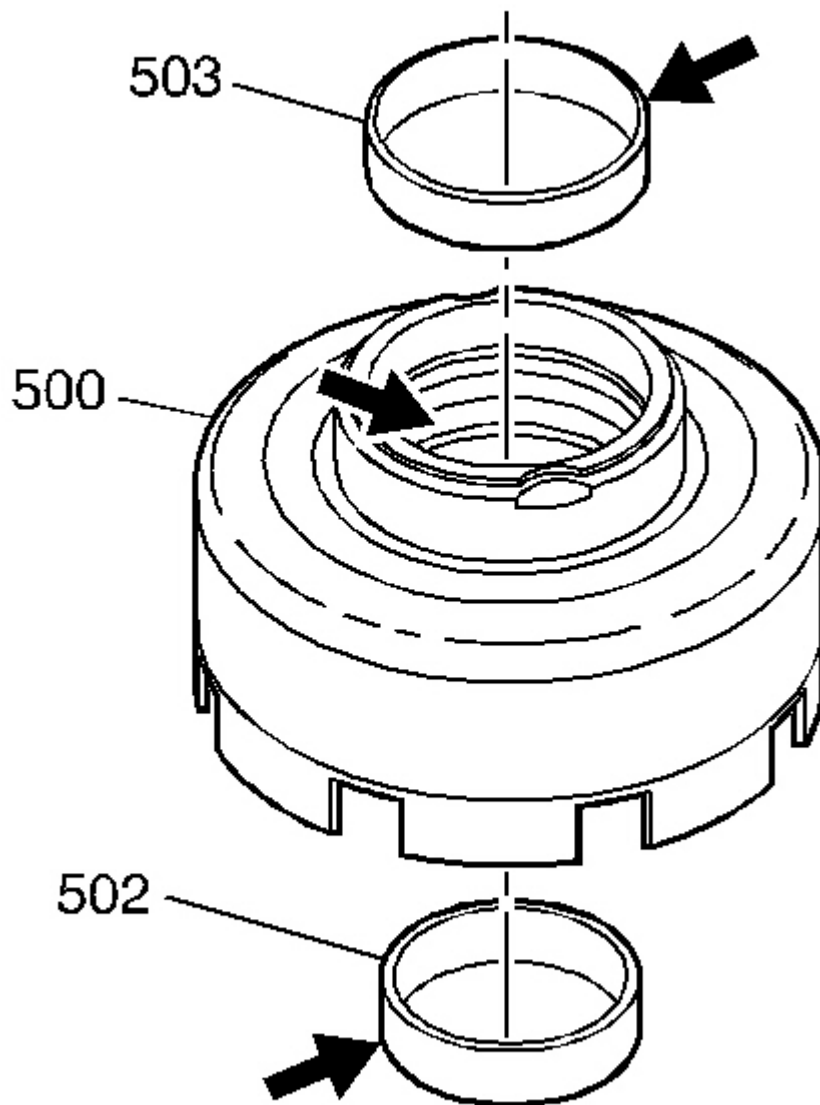


Fig. 159: Inspecting Reverse Clutch Housing Bushings
Courtesy of GENERAL MOTORS CORP.

7. Inspect the reverse clutch housing bushings (502, 503) for damage.

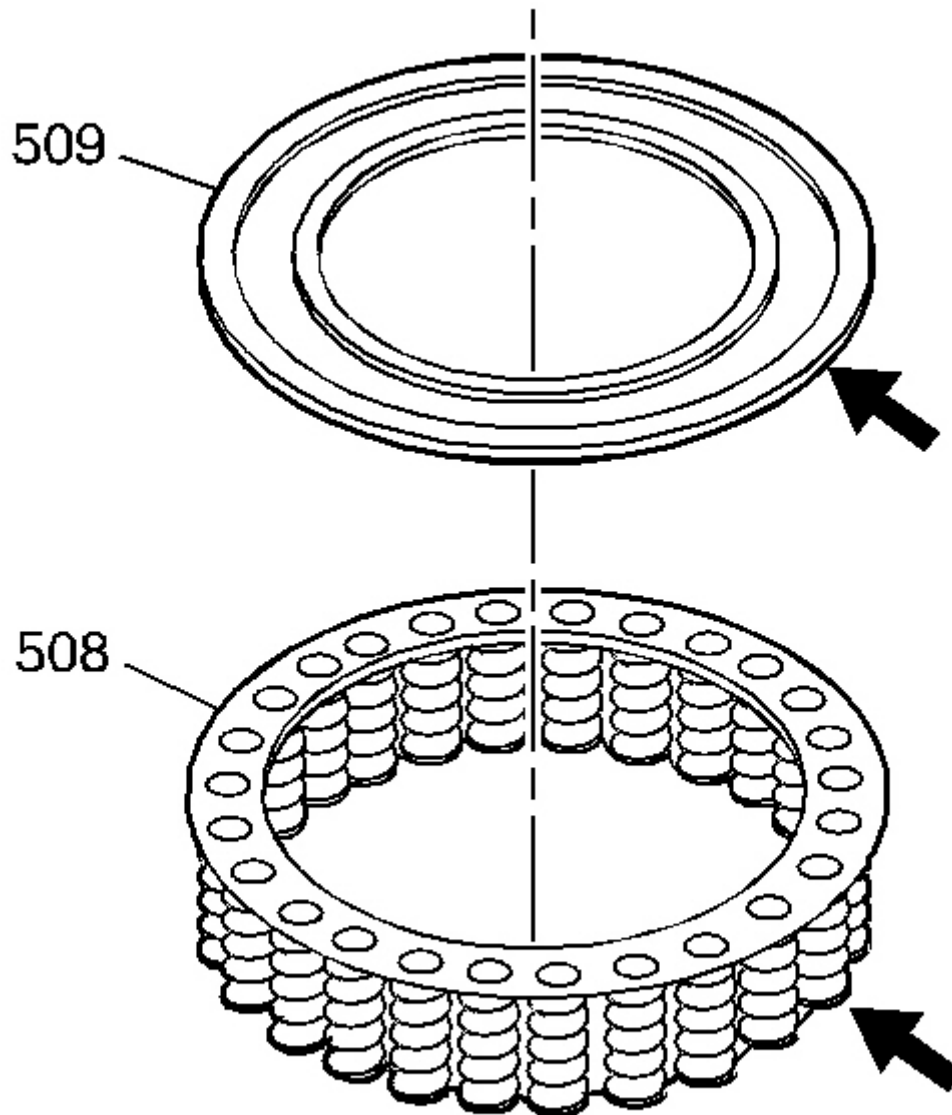


Fig. 160: View Of Spring And Retainer Assembly
Courtesy of GENERAL MOTORS CORP.

8. Inspect the spring and retainer assembly (508) for damaged or missing springs.

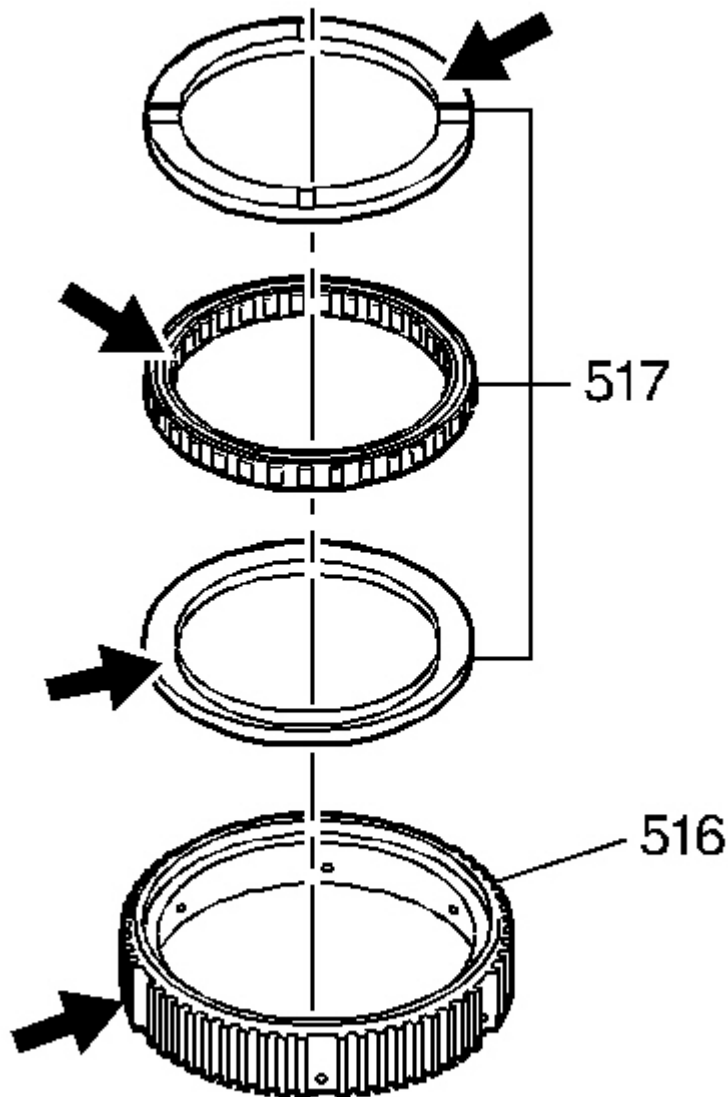


Fig. 161: Identifying Second Sprag & Races For Wear
Courtesy of GENERAL MOTORS CORP.

9. Inspect the second sprag (517) for flipped or damaged sprags. Inspect both of the second sprag races for damage.

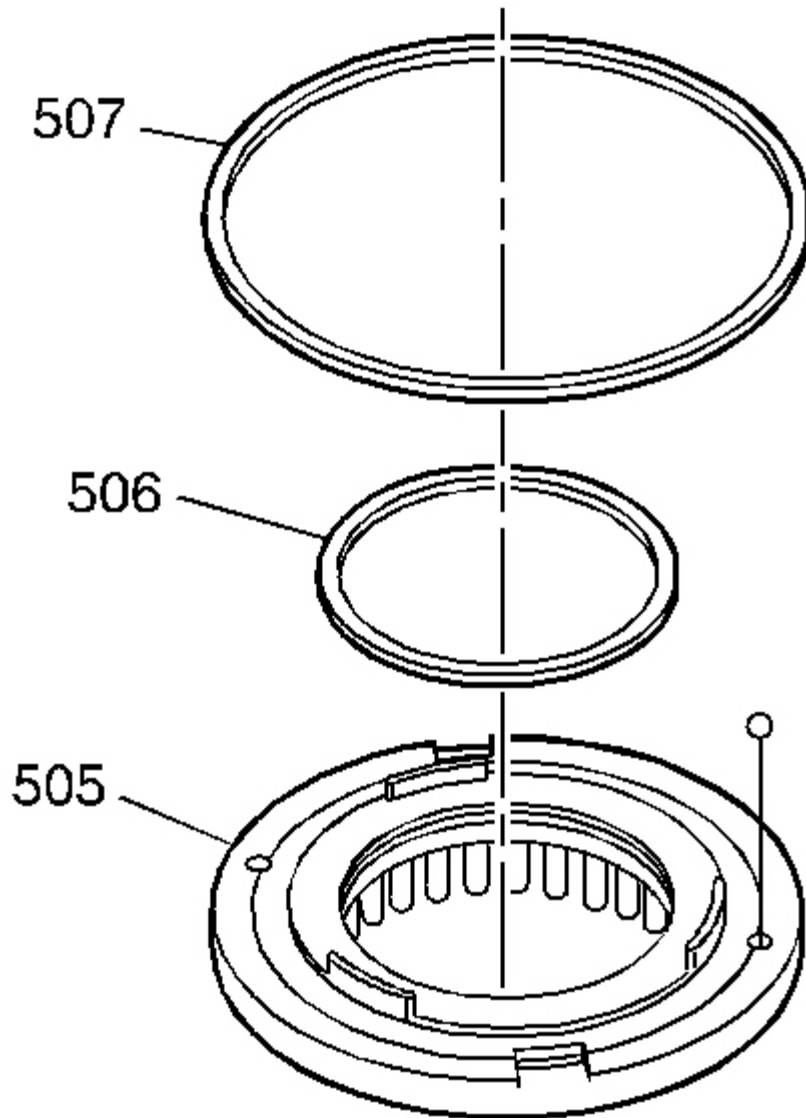


Fig. 162: Installing Reverse Piston Seals
Courtesy of GENERAL MOTORS CORP.

10. Install new seals (506, 507) on the reverse piston (505).

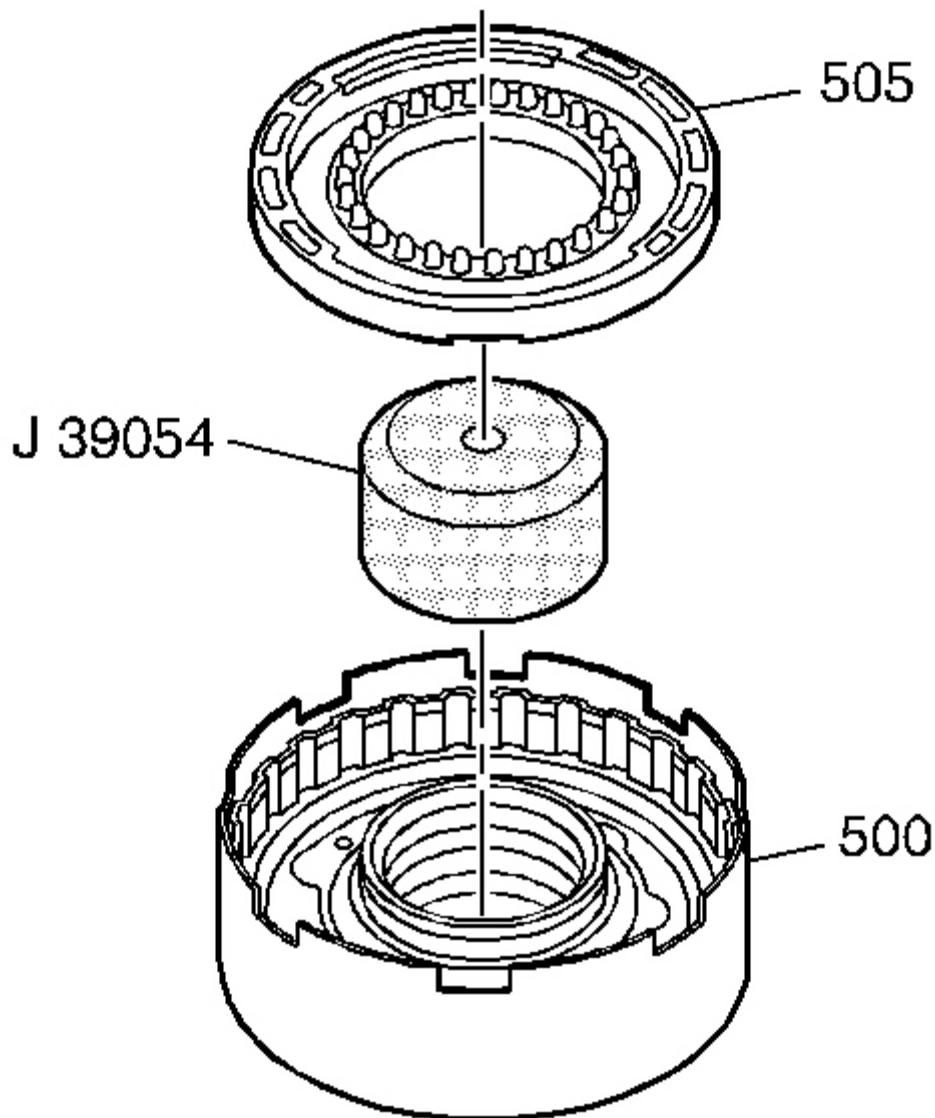


Fig. 163: Installing The Reverse Clutch Piston (505) Into The Reverse Clutch Housing Using J 39054
Courtesy of GENERAL MOTORS CORP.

11. Install the reverse clutch piston (505) into the reverse clutch housing. Install the **J 39054** in order to protect the inner seal. See **Special Tools**. Make sure that the outer seal does not

roll backwards. Apply a light coating of Transjel(tm) so that the seal will slide easily.

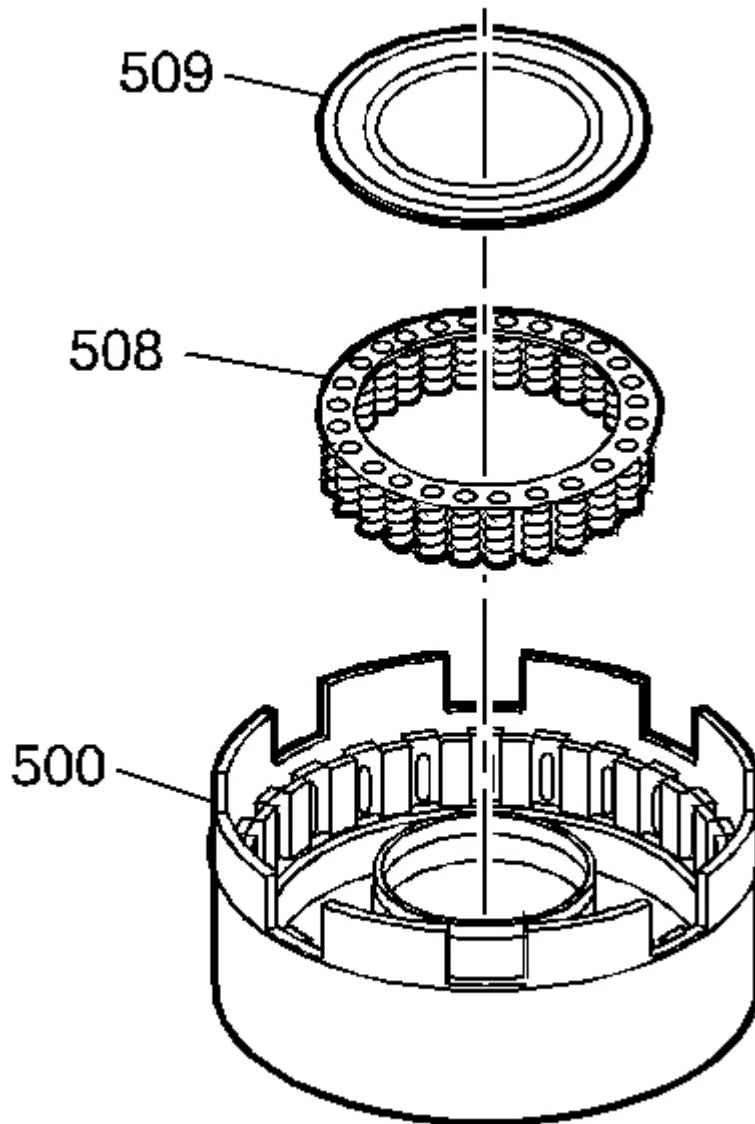


Fig. 164: Locating Spring And Retainer Assembly Into The Reverse Clutch Housing
Courtesy of GENERAL MOTORS CORP.

12. Install the spring and retainer assembly (508, 509) into the reverse clutch housing (500).

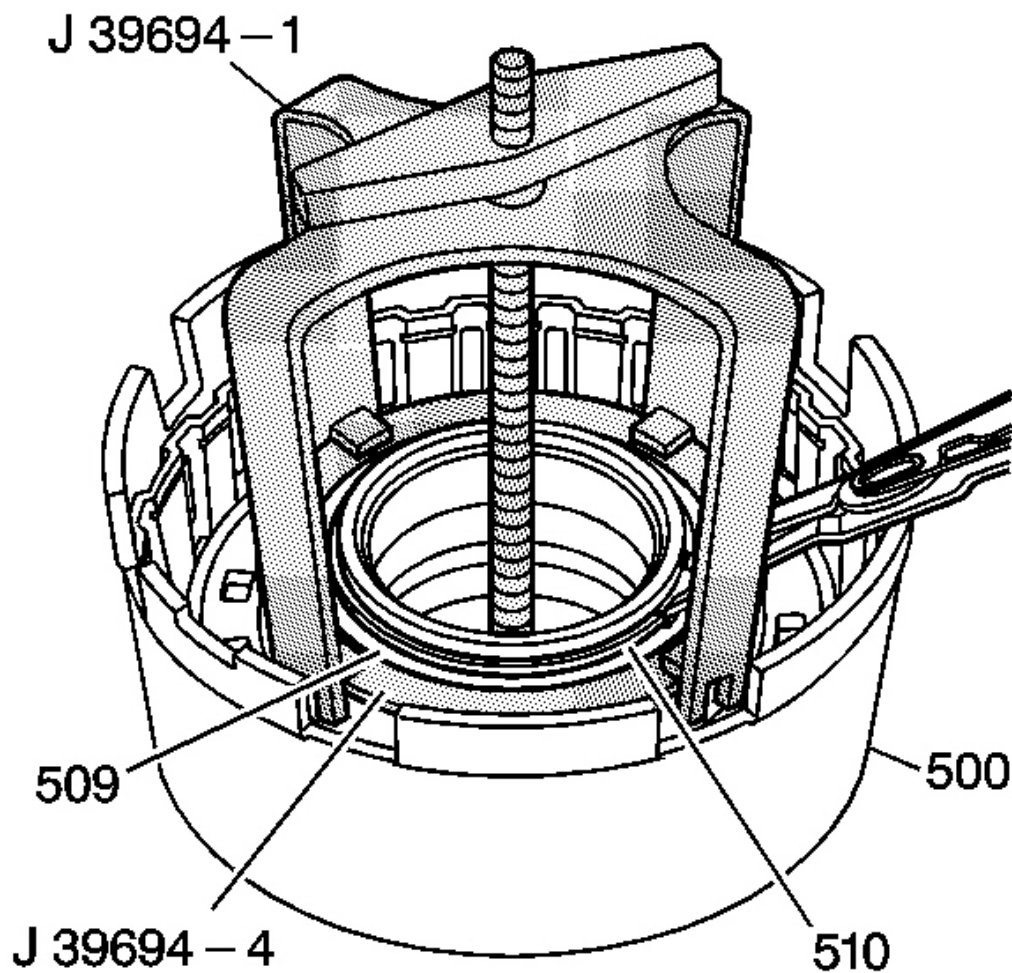


Fig. 165: Compressing The Spring And Retainer Assembly Using J 39694
Courtesy of GENERAL MOTORS CORP.

13. Use the **J 39694** spring compressor to compress the spring and install the snap ring (510). See **Special Tools**. Remove the compressor tool.

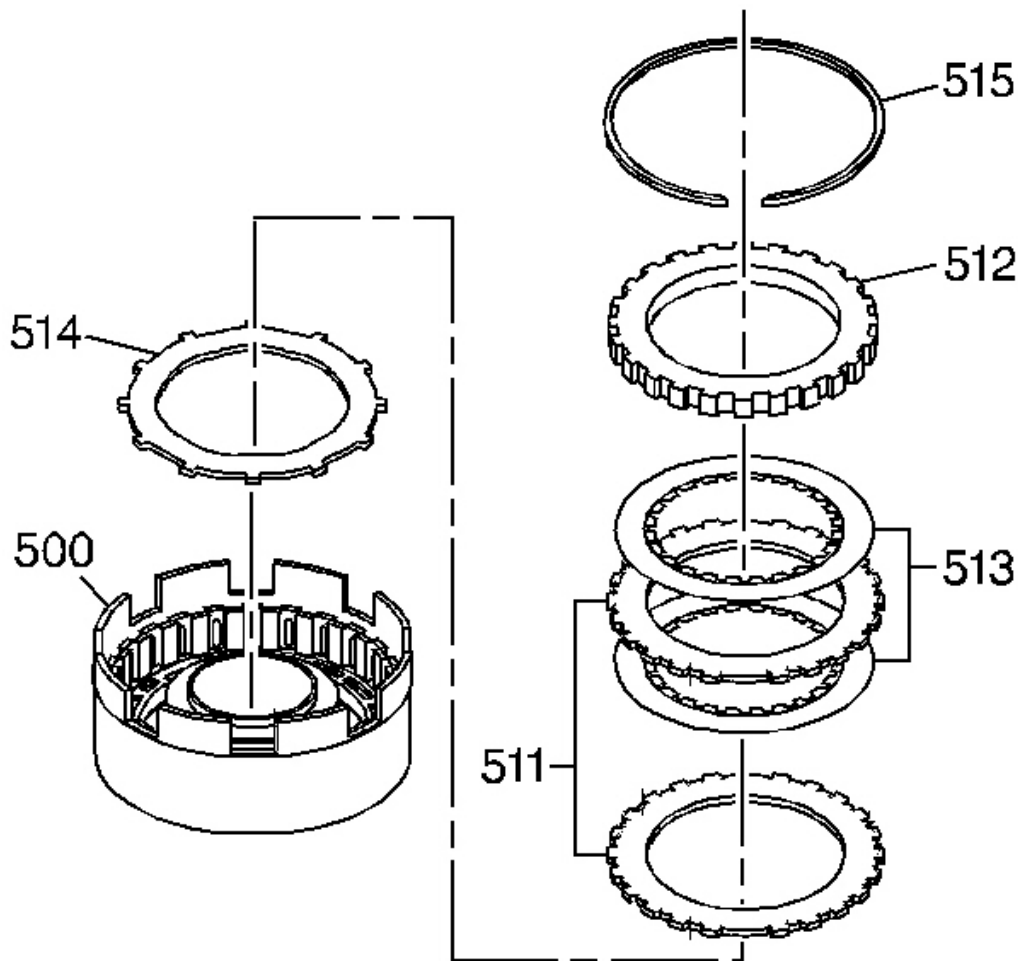


Fig. 166: View Of Reverse Clutch Plates
Courtesy of GENERAL MOTORS CORP.

14. Install the following parts:

1. The waved plate (514). Align the waved plate tangs with the inserts in the reverse clutch piston.
2. The two steel (511) and the two fiber (513) clutch plates, starting with steel and alternating with fiber
3. The apply plate (512) with the stepped side up
4. The snap ring (515)

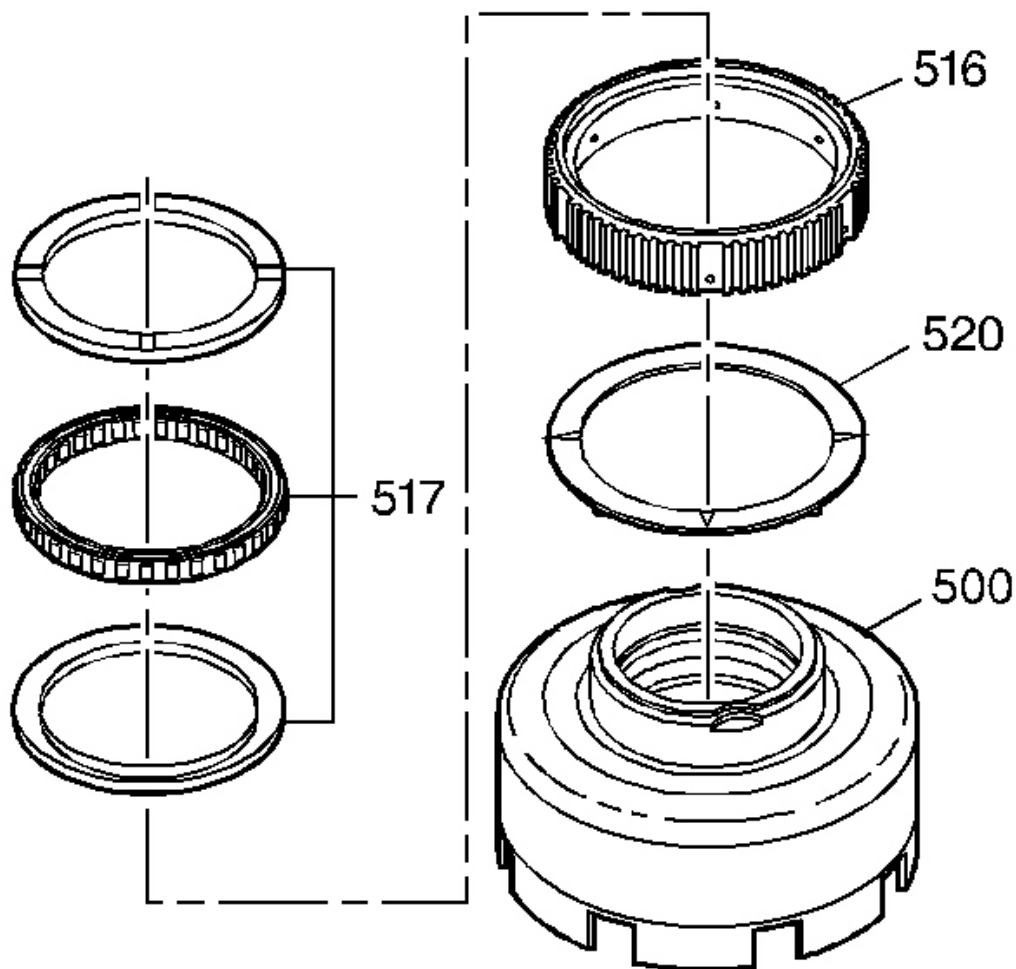


Fig. 167: Installing 2nd Sprag Race And Clutch Assembly
Courtesy of GENERAL MOTORS CORP.

15. Install the following parts:

1. The 2nd clutch outer race thrust washer (520)
2. The 2nd sprag clutch assembly (517) into the 2nd sprag outer race (516)
3. The 2nd sprag race and clutch assembly onto the reverse clutch housing (500)



Fig. 168: Checking Second Sprag Freewheel
Courtesy of GENERAL MOTORS CORP.

16. Verify that the second sprag freewheels only in a clockwise direction.

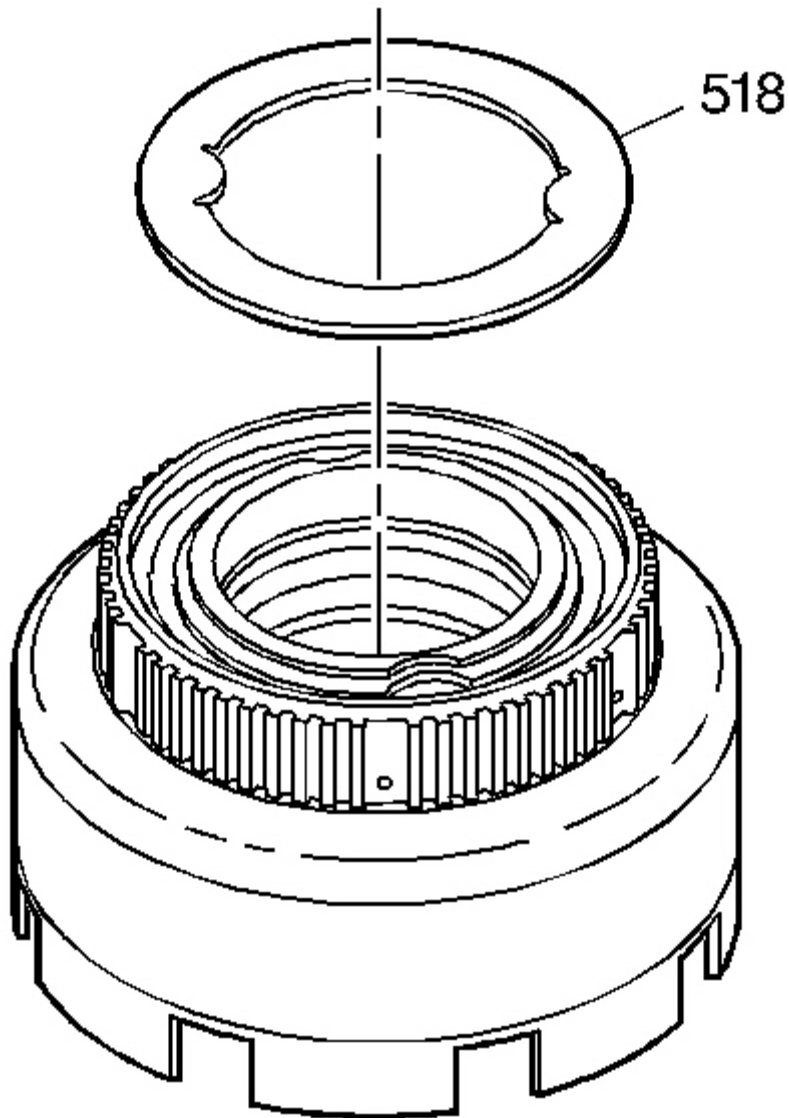


Fig. 169: Identifying Sprag Clutch Retainer
Courtesy of GENERAL MOTORS CORP.

17. Install the sprag clutch retainer (518).

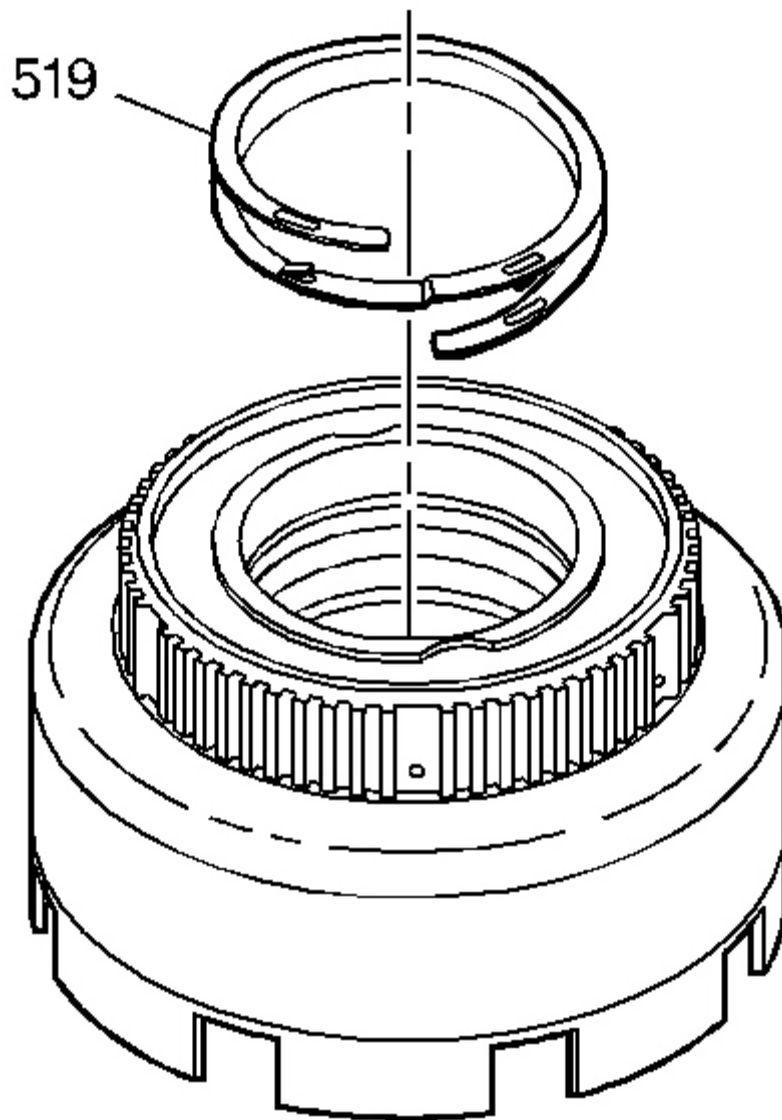


Fig. 170: Locating Spiral Snap Ring
Courtesy of GENERAL MOTORS CORP.

18. Install the new spiral snap ring (519). Verify that the spiral snap ring tabs lock into place and that the snap ring is properly seated.

Tools Required

J 34741-3 Input Shaft Seal Sizer

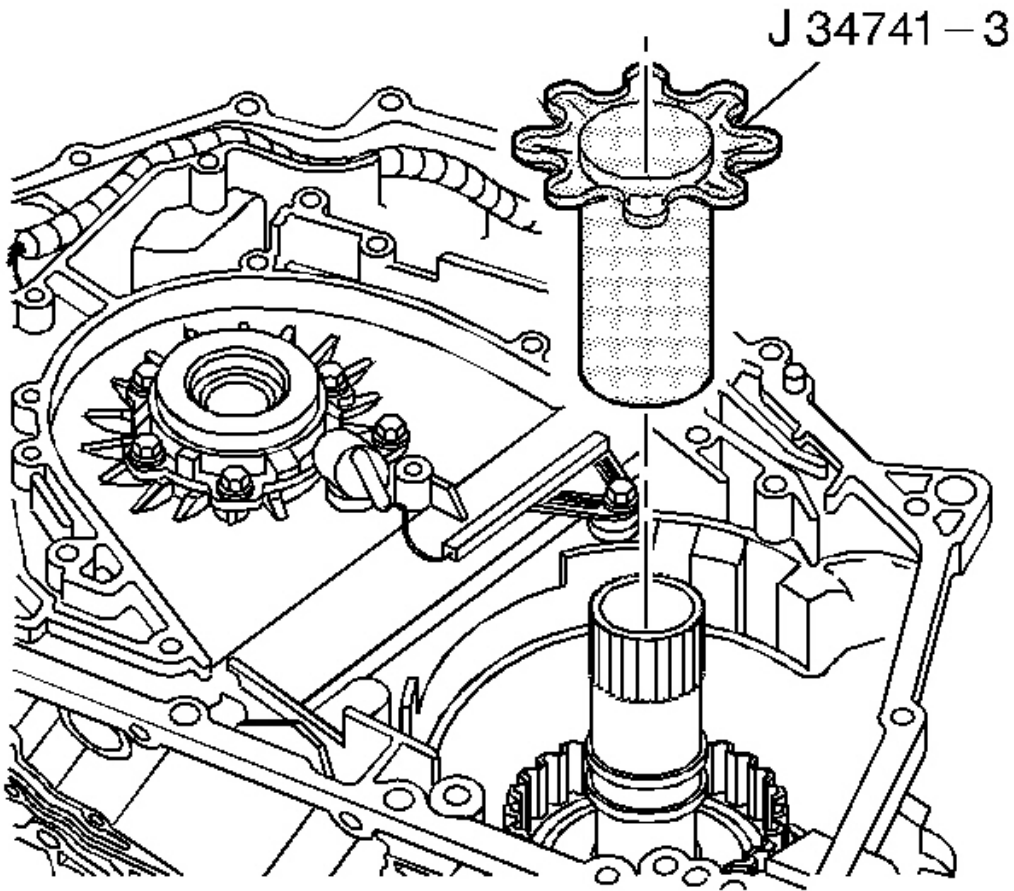


Fig. 171: Installing J 34741-3 Over The Input Shaft Oil Seal Rings
Courtesy of GENERAL MOTORS CORP.

1. Remove the **J 34741-3** .

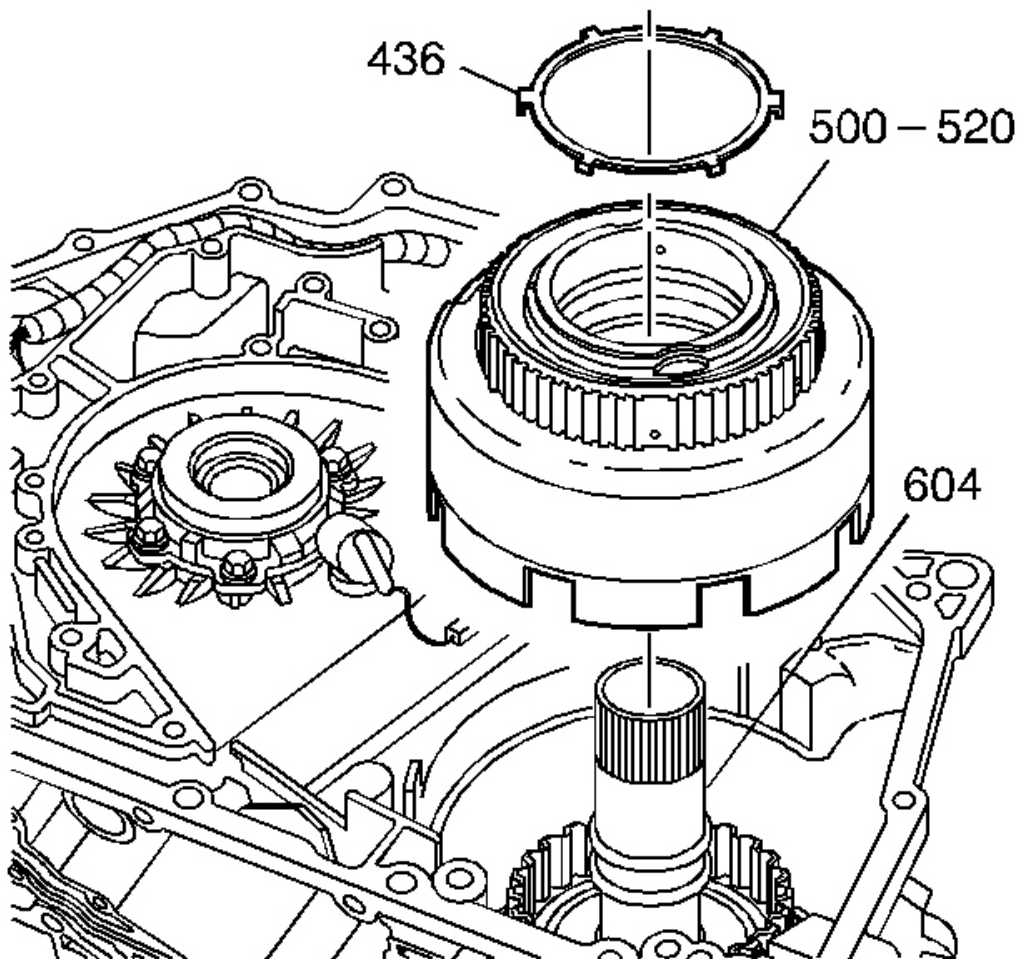


Fig. 172: Installing Reverse Clutch Housing & Second Sprag Assembly
Courtesy of GENERAL MOTORS CORP.

2. Install the reverse clutch housing and the second sprag assembly (500-520) onto the reaction carrier assembly (604). The teeth on the reverse clutch housing must seat into the reaction sun shell. Twist the reverse housing to install and insure proper seating.
3. Install the thrust washer (436) on top of the reverse clutch housing with the tabs pointing down.

SECOND CLUTCH PLATES INSTALLATION

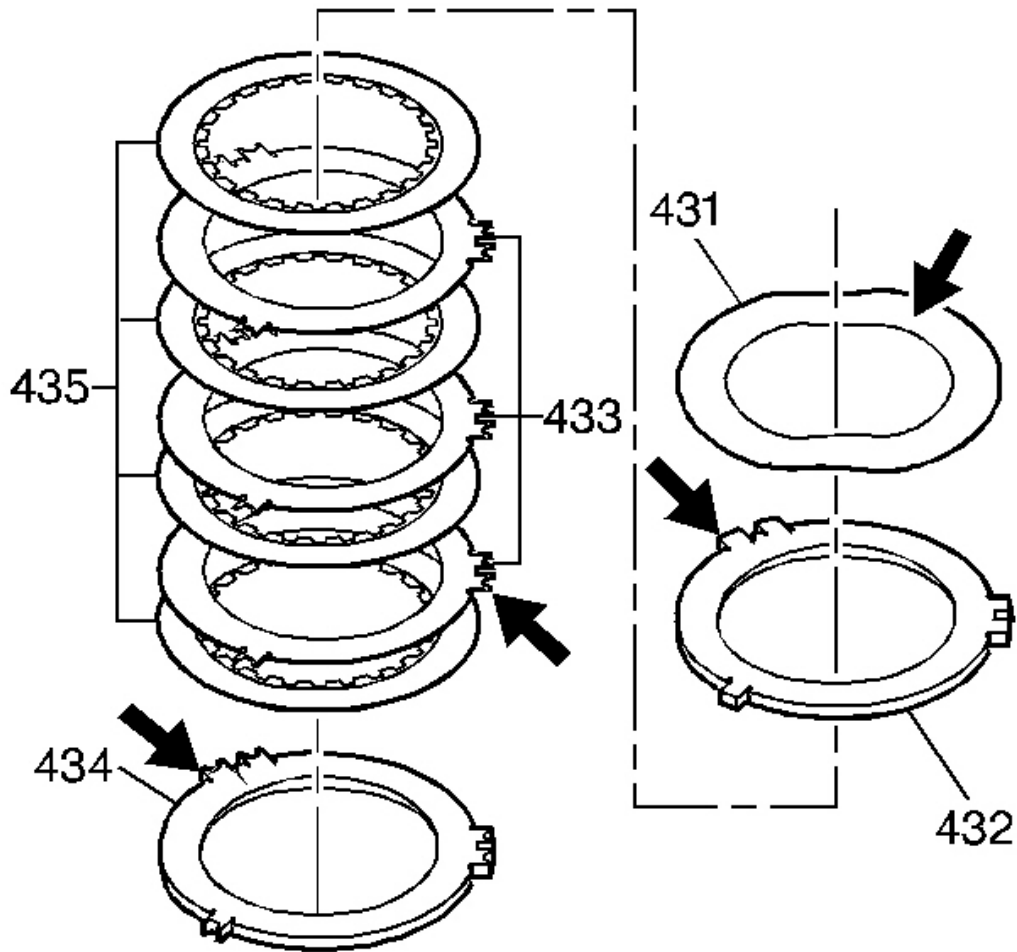


Fig. 173: Locating Inspection Points On Second Clutch Plates
Courtesy of GENERAL MOTORS CORP.

1. Inspect the second clutch wave plate (431) and all of the steel plates (433) for burning or damage.

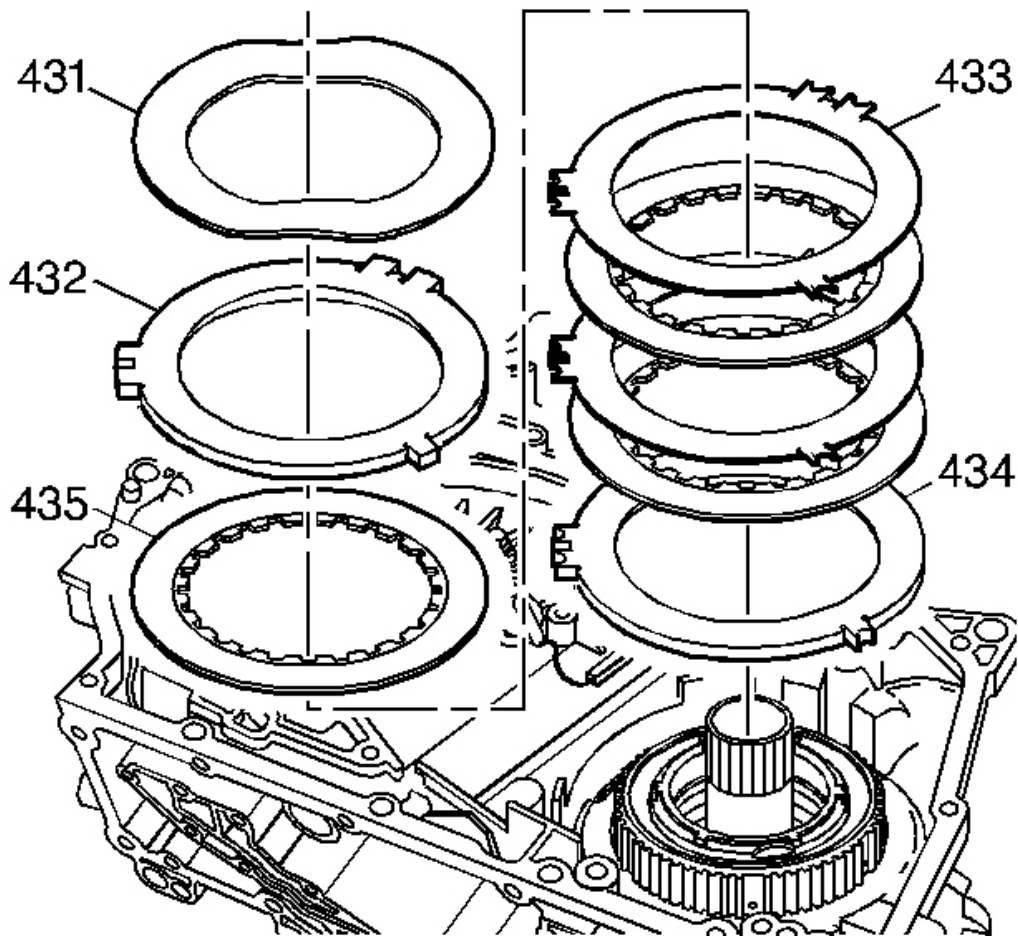


Fig. 174: Installing Second Clutch Plates
Courtesy of GENERAL MOTORS CORP.

2. Install the following parts:
 1. The second clutch backing plate (434) with flat side facing up
 2. The four fiber clutch plates (435)
 3. The four steel clutch plates (433)
 4. The backing plate (432)
 5. The wave plate (431)

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

The following is the recommended procedure for air checking the 2nd clutch (430), 3rd clutch (606) and reverse clutch (505) assemblies. This procedure is used to apply a clutch assembly during disassembly and or reassembly of the Hydra-Matic 4T80-E transaxle. To properly perform this procedure, you will need a rubber tipped air nozzle and filtered compressed shop air. The recommended line pressure of the compressed shop air is at least 90 psi.

CAUTION: Wear safety glasses when using compressed air in order to prevent eye injury.

IMPORTANT: The 2nd clutch (430) can be seen when it applies. If unable to verify that a clutch or clutches applies with the compressed shop air, then inspect the following components for possible causes.

With the 2nd clutch (430), reverse clutch (505) and 3rd clutch (606) installed in the case, apply 50-60 psi of filtered compressed shop air to the appropriate passages located in the driven sprocket support (418), passage 39 for the 2nd clutch, passage 40 for the 3rd clutch and passage 33 for the reverse clutch. If the clutches are assembled properly and sealing, you should be able to hear them apply and release.

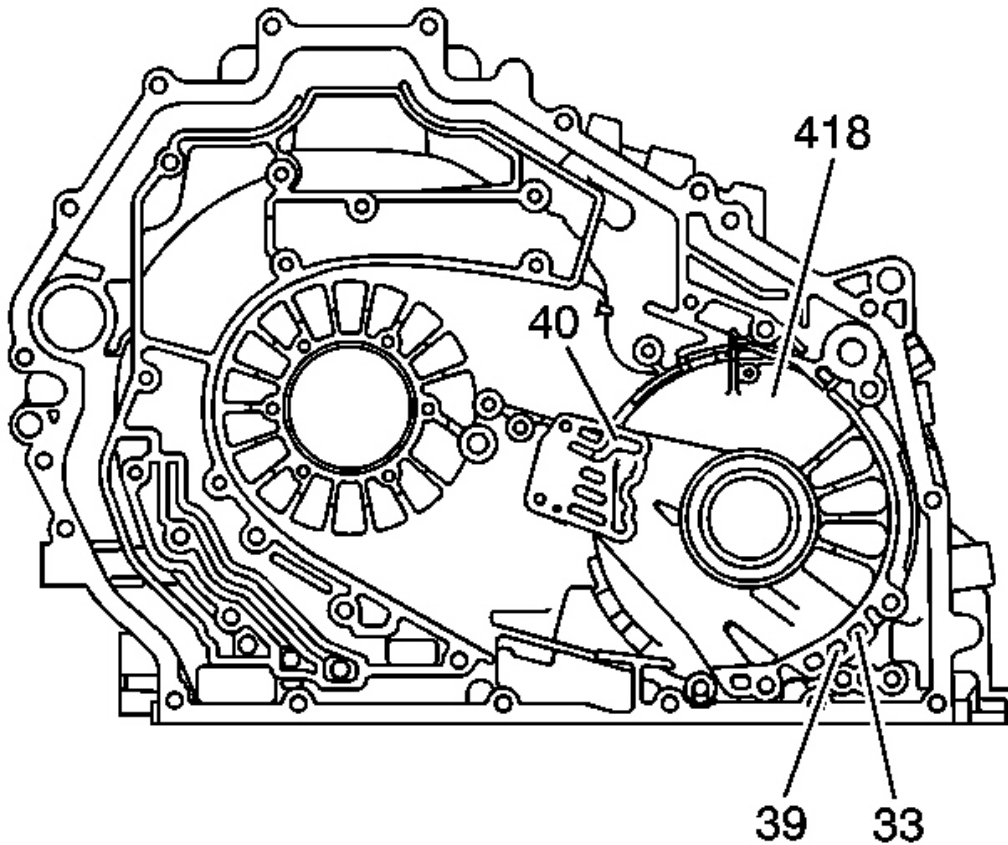


Fig. 175: Inspection Areas In Driven Sprocket Support
Courtesy of GENERAL MOTORS CORP.

1. Inspect the driven sprocket support (418) for the following:
 - Oil rings (422) sealing surface damaged and or missing
 - Lobe seal rings (423) damaged sealing surface and or missing
2. Inspect the reverse clutch assembly (505) for the following:
 - Piston inner (506) or outer (507) seal damaged sealing surface and or missing
 - Piston (505) physical damage and or checkball damage or missing
 - Spring and retainer assembly (508) damage
 - Reverse clutch housing (500) for physical damage or a poor sealing surface finish
 - Clutch plates (511, 512, 513, 514) damaged and or missing the correct number of

2006 Buick Lucerne CXS
2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

plates.

3. Inspect the 2nd clutch for the following:

- 2nd clutch piston (430) physical damage
- Oil transfer sleeve (419) damage or restricted passage
- 2nd clutch plates (431, 432, 433, 434, 435) damaged and or missing the correct number of plates

4. Inspect the 3rd clutch for the following:

- 3rd clutch piston assembly (606) physical damage
- 3rd clutch piston assembly (606) checkball (2) damaged and or missing
- Oil seal rings (614) damaged sealing surface and or missing
- Transfer sleeve (603) damage and or restricted oil passage.
- Clutch plates (610, 611, 612, 613) damage and or missing the correct number of plates

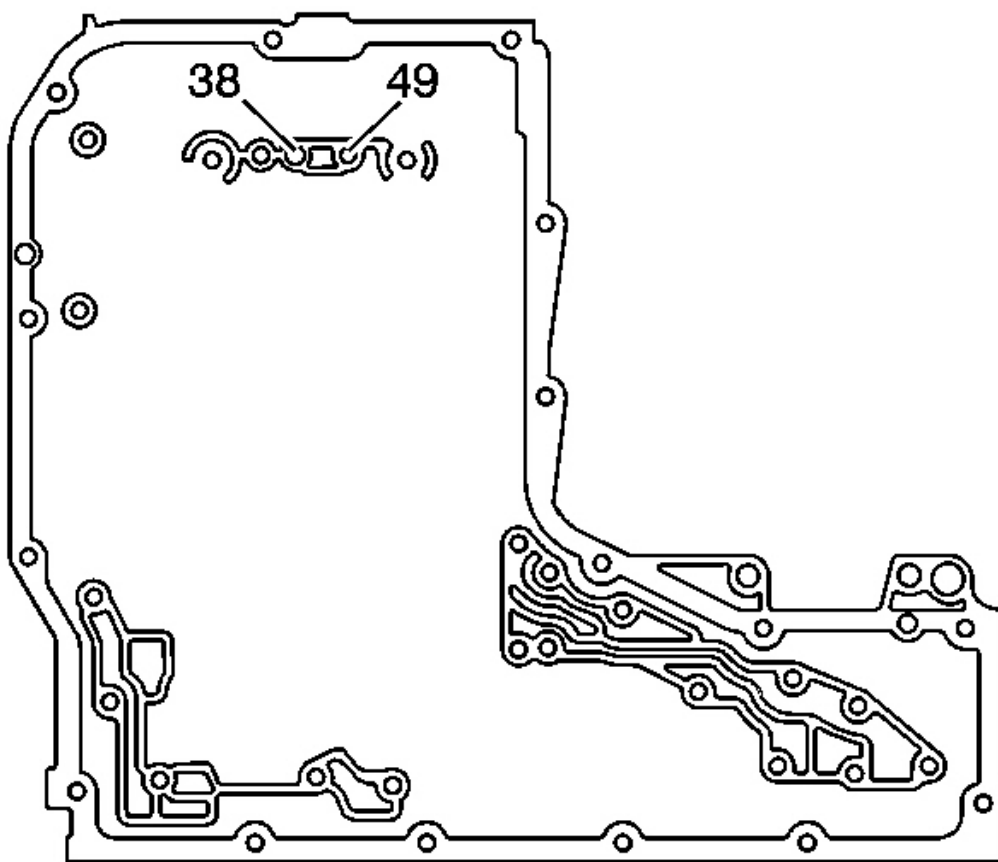


Fig. 176: Blowing Air In Passages To Forward Clutch & Coast Clutch
Courtesy of GENERAL MOTORS CORP.

5. To check the forward and coast clutch assemblies, apply 50-60 psi of filtered compressed shop air pressure to the appropriate passages located in the lower case to the forward clutch support assembly, passage (38) for the forward clutch and passage (49) for the coast clutch. You should be able to hear the clutches apply. If not, inspect the following for possible causes.
6. Inspect the forward coast clutch for the following:
 - Forward clutch piston (807) inner (808) and or outer (809) seals, for damaged sealing surface and or missing
 - Coast clutch piston assembly (810) physical damage
 - Forward piston (807) physical damage

2006 Buick Lucerne CXS
2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

- Clutch plates (812, 813, 814, 816, 817, 819) damage and or missing the correct number of plates
- Forward clutch apply ring (811) damage and or missing

7. Inspect the forward/coast clutch support for the following:

- Support/housing oil seal rings (829) damaged sealing surface and or missing
- Oil Transfer sleeve (824) physical damage and or restricted oil passages

DRIVEN SPROCKET SUPPORT DISASSEMBLE

Tools Required

J 39694 Second Clutch Spring Compressor. See **Special Tools**.

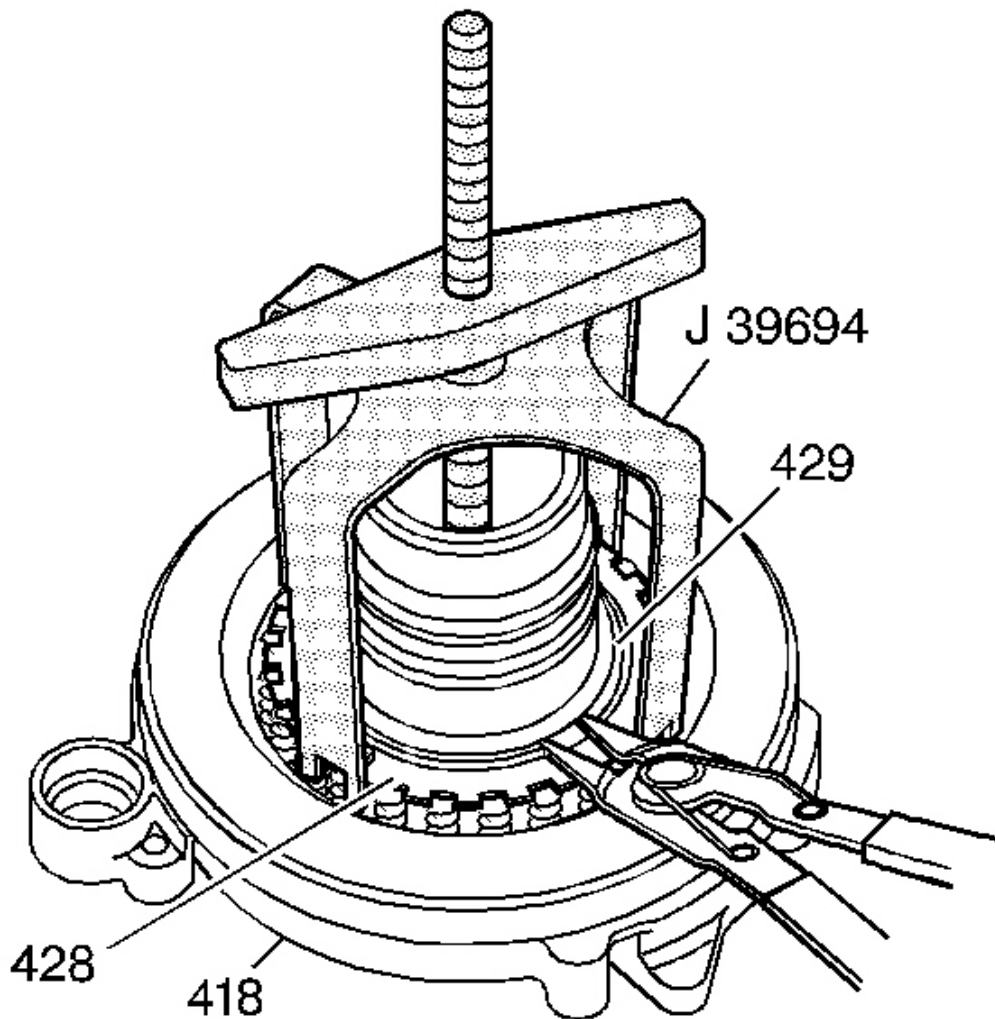


Fig. 177: Compressing Second Clutch Spring Using J 39694
Courtesy of GENERAL MOTORS CORP.

1. Use the **J 39694** second clutch spring compressor to compress the spring and remove the snap ring (429). See **Special Tools**. Then remove the spring compressor.

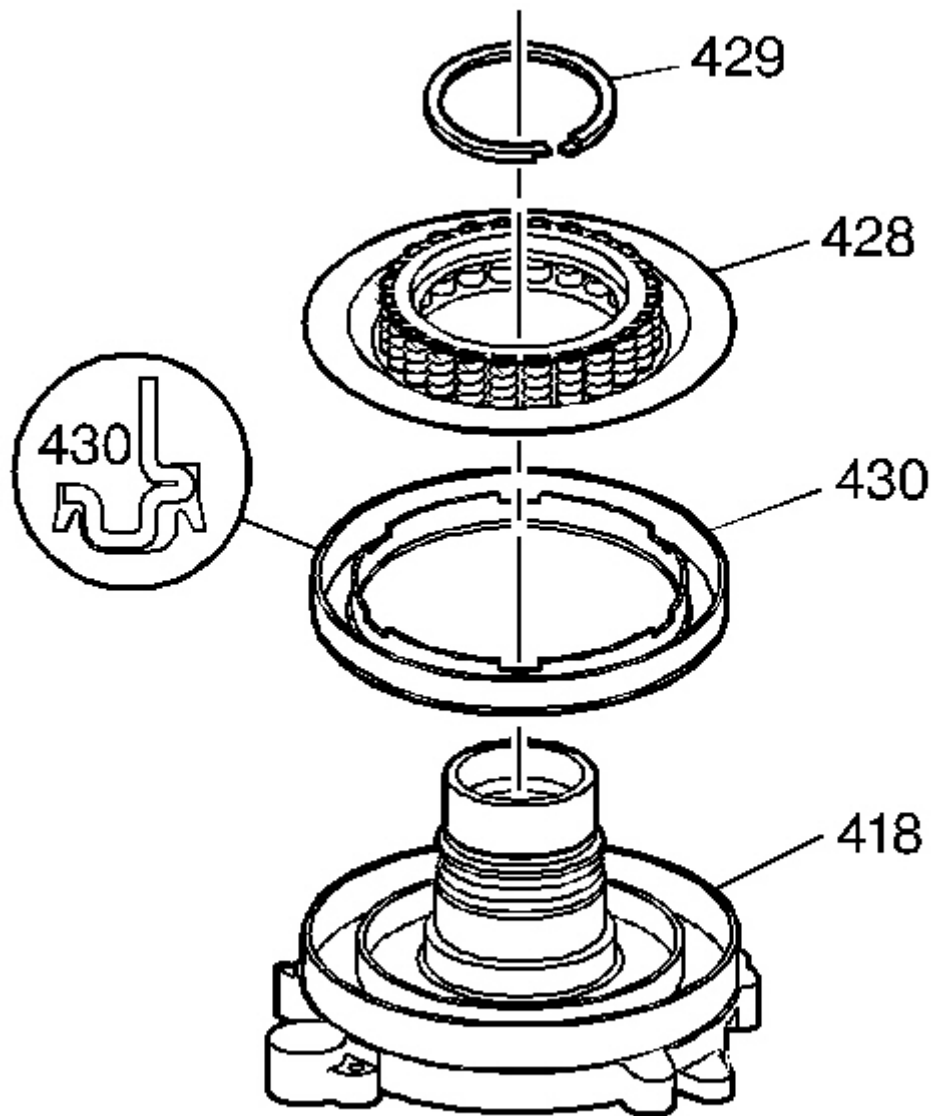


Fig. 178: Piston Assembly & Return Spring And Retainer Assembly Inspection Points

Courtesy of GENERAL MOTORS CORP.

2. Remove the return spring and retainer assembly (428), and remove the piston assembly (430).

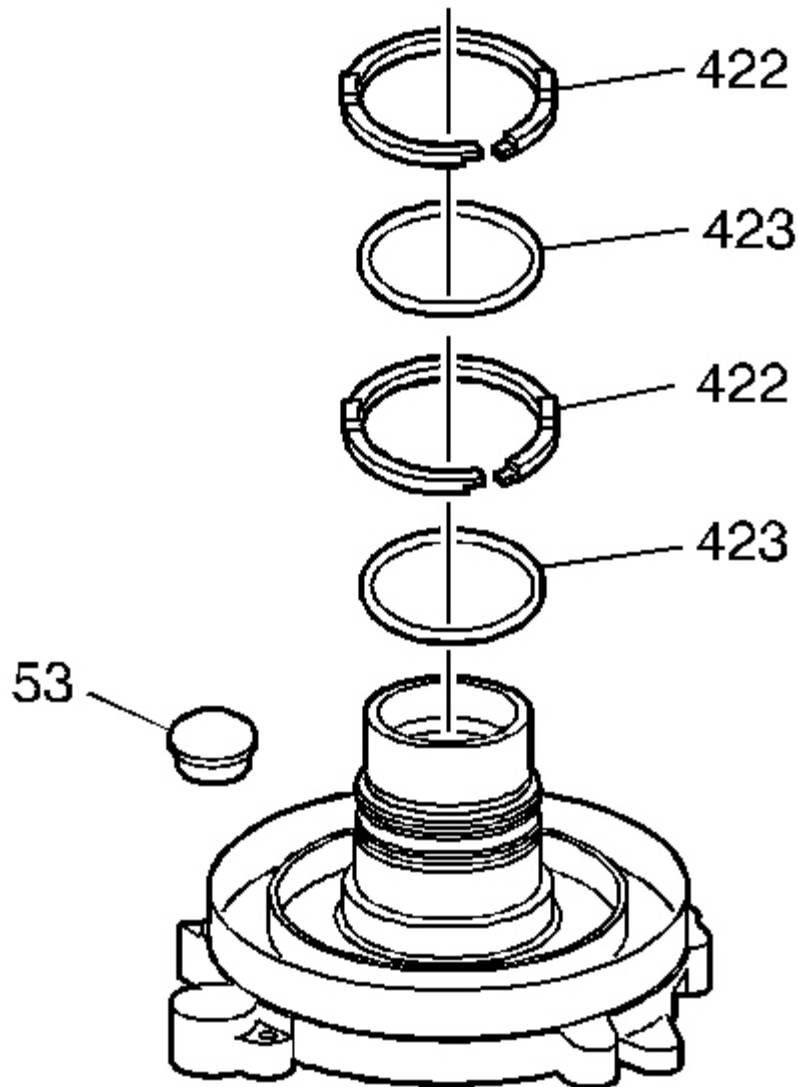


Fig. 179: Identifying Oil Ring & Scavenge Tube Seal Inspection Areas
Courtesy of GENERAL MOTORS CORP.

3. Remove the following parts:
 - The two sealing rings (423)
 - The two oil rings (422)

- The scavenge tube seal (53)

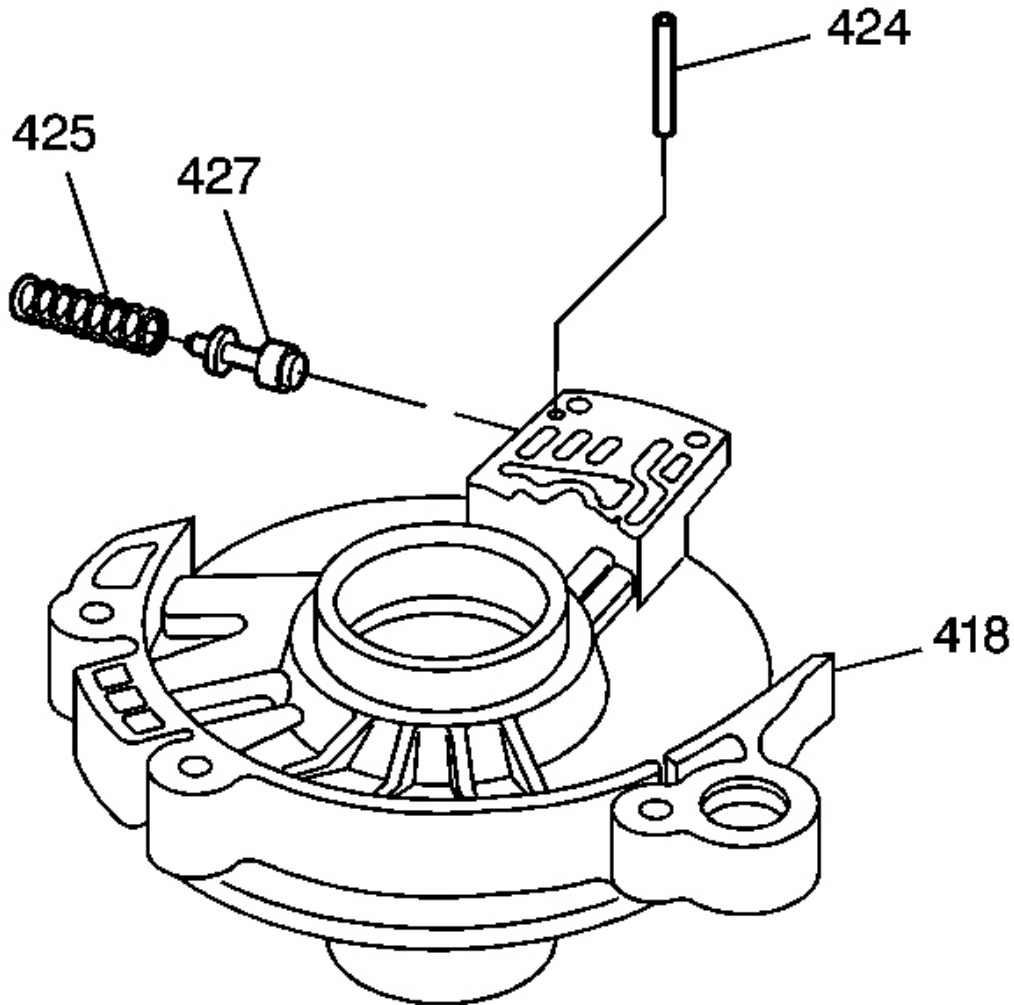


Fig. 180: Locating Third Clutch Exhaust Valve, Spring, And Pin
Courtesy of GENERAL MOTORS CORP.

4. Remove the following parts:
 - The third clutch exhaust valve spring retaining pin (424)
 - The third clutch exhaust valve spring (425)
 - The third clutch exhaust valve (427)

DRIVEN SPROCKET SUPPORT ASSEMBLY

Tools Required

J 39694 Spring Compressor. See Special Tools.

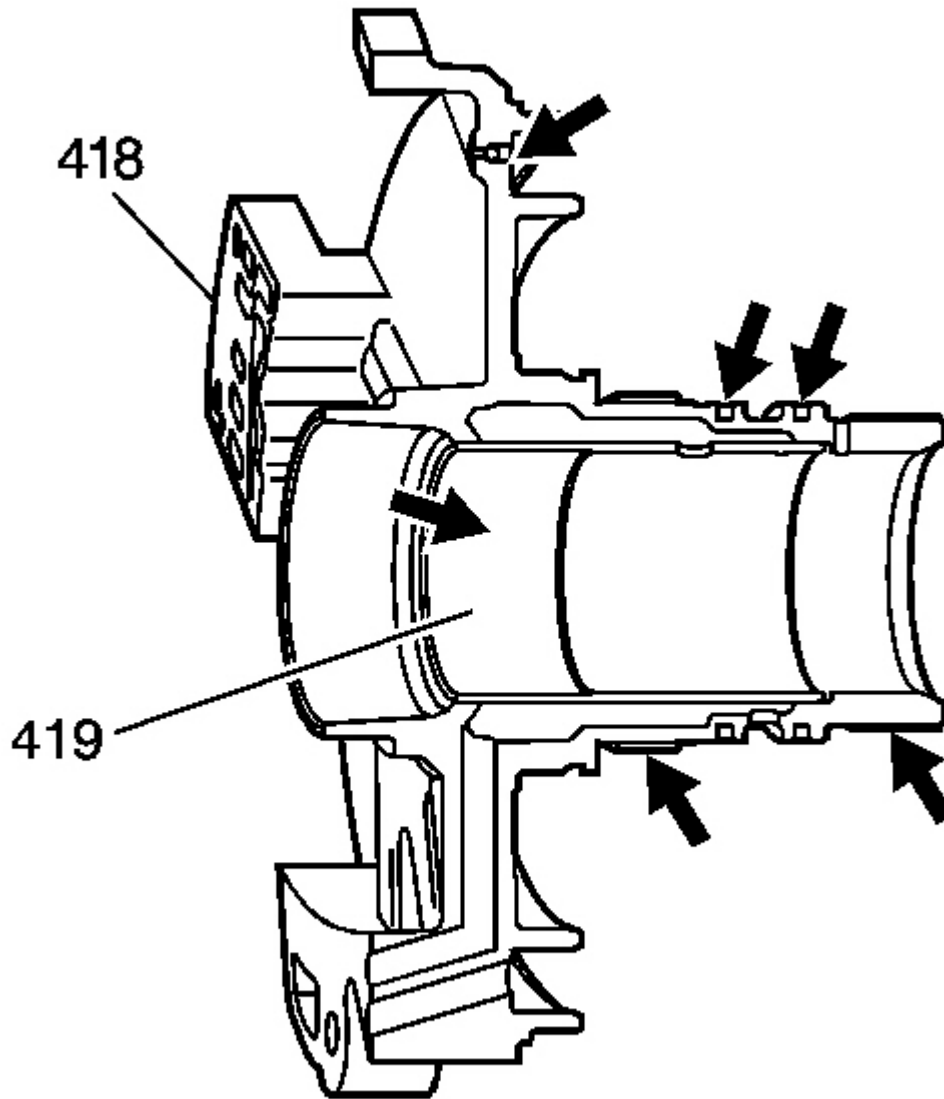


Fig. 181: View Of Inspection Areas On Oil Transfer Sleeve
Courtesy of GENERAL MOTORS CORP.

2006 Buick Lucerne CXS
2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

1. Inspect the driven sprocket support (418) for the following:
 - Hub nicks, burrs, or damage
 - Plugged feed holes
 - Worn or damaged splines
 - Bushings for nicks, scratches, or wear
 - The checkball for movement
 - The seal ring grooves for damage
2. Inspect the oil transfer sleeve (419) for scoring or internal damage. If damaged replace the driven sprocket support (418).

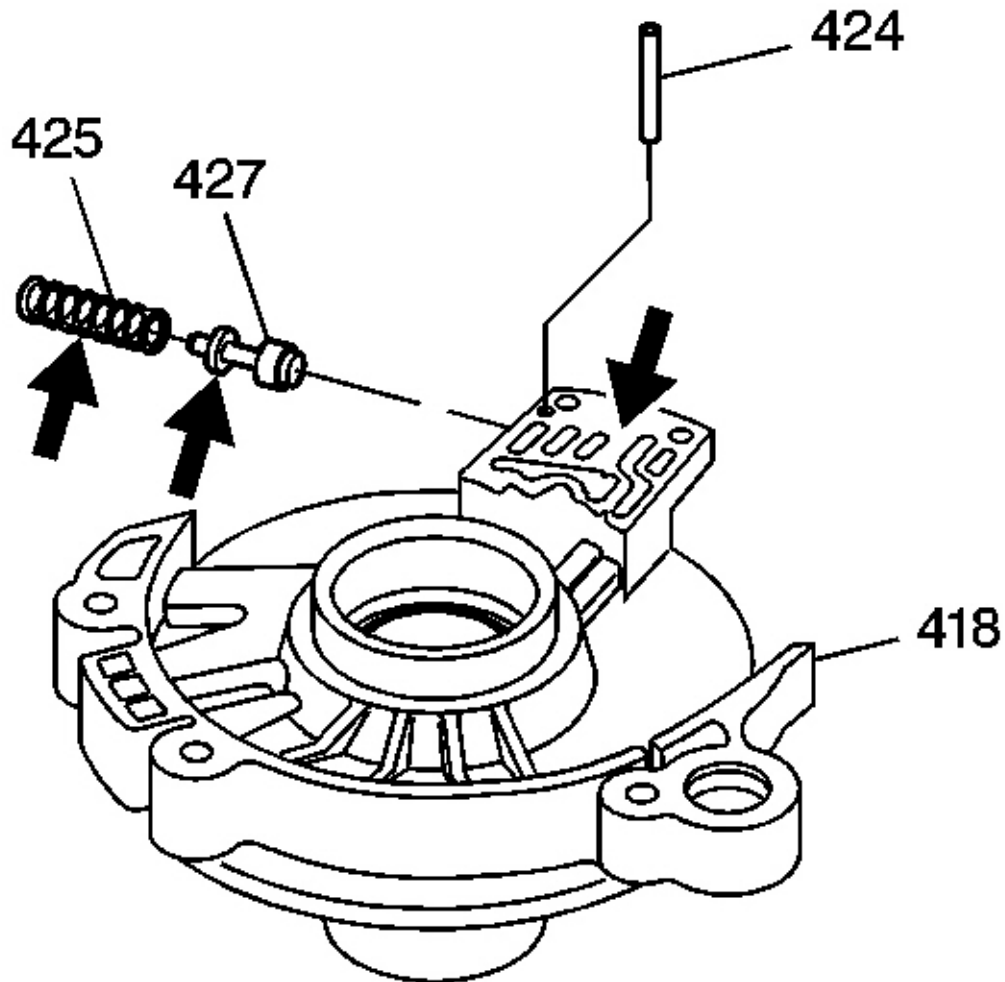


Fig. 182: Identifying Exhaust Valve Spring Inspection Points
Courtesy of GENERAL MOTORS CORP.

3. Inspect the following parts for damage:
 - The third clutch exhaust valve (427)
 - The exhaust valve spring (425)

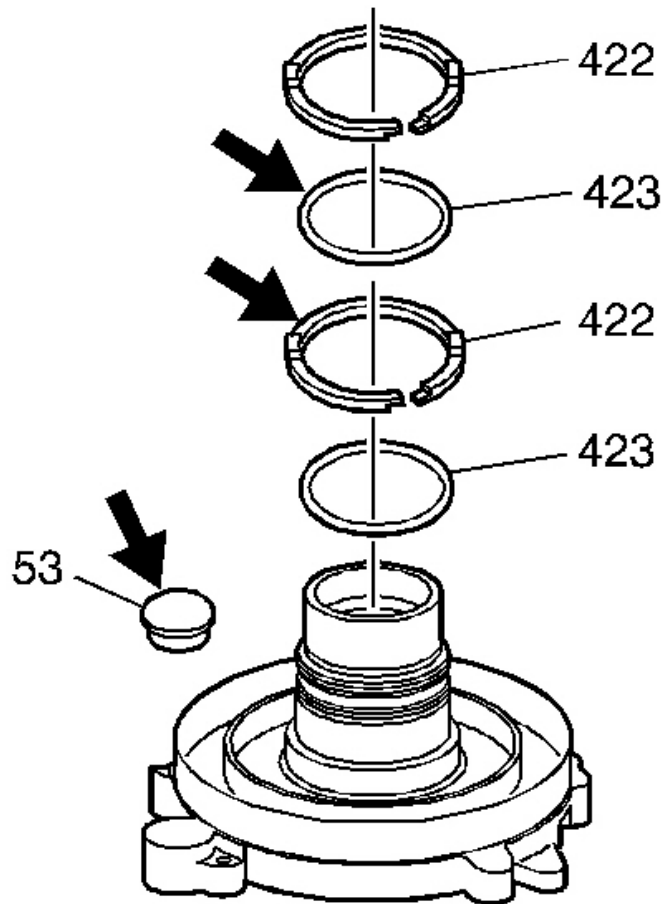


Fig. 183: Locating Inspection Points On Sealing Rings & Scavenge Tube Seal
Courtesy of GENERAL MOTORS CORP.

4. Inspect the two sealing rings (423) and the two oil rings (422). Replace any damaged rings.
5. Inspect the scavenge tube seal (53). If the seal is damaged, replace the seal.

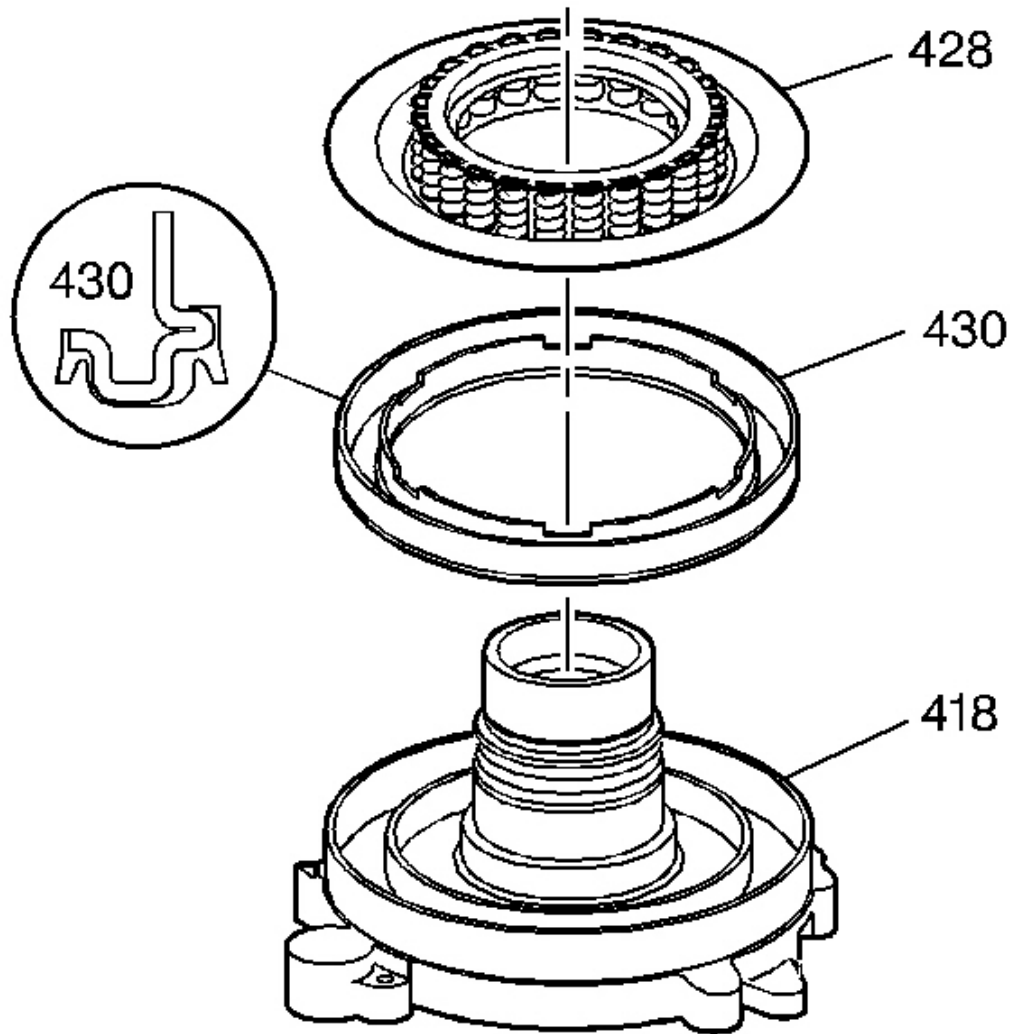


Fig. 184: View Of Second Clutch Piston And Seal Assembly
Courtesy of GENERAL MOTORS CORP.

6. Inspect the second clutch piston and seal assembly (430). Inspect the second clutch spring and retainer assembly (428) for damage. Replace any damaged part.

NOTE: Do not roll the seals when installing the second clutch piston assembly (430), or damage may occur.

7. Install the second clutch piston assembly (430). Twist and push the piston simultaneously. Use a light coating of **J 36850** or equivalent.

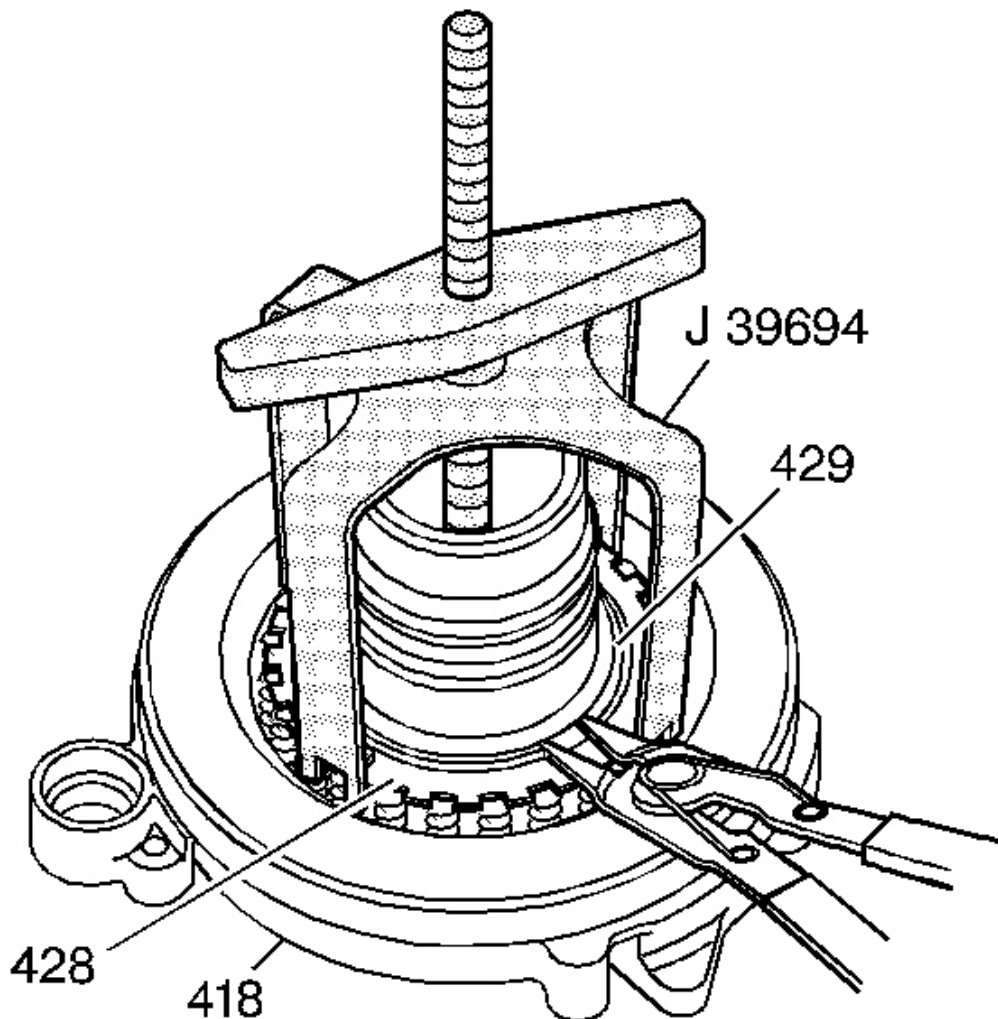


Fig. 185: Compressing Second Clutch Spring Using J 39694
Courtesy of GENERAL MOTORS CORP.

8. Use the **J 39694** to compress the spring and retainer assembly (428). See **Special Tools**.
9. Install the snap ring (429).

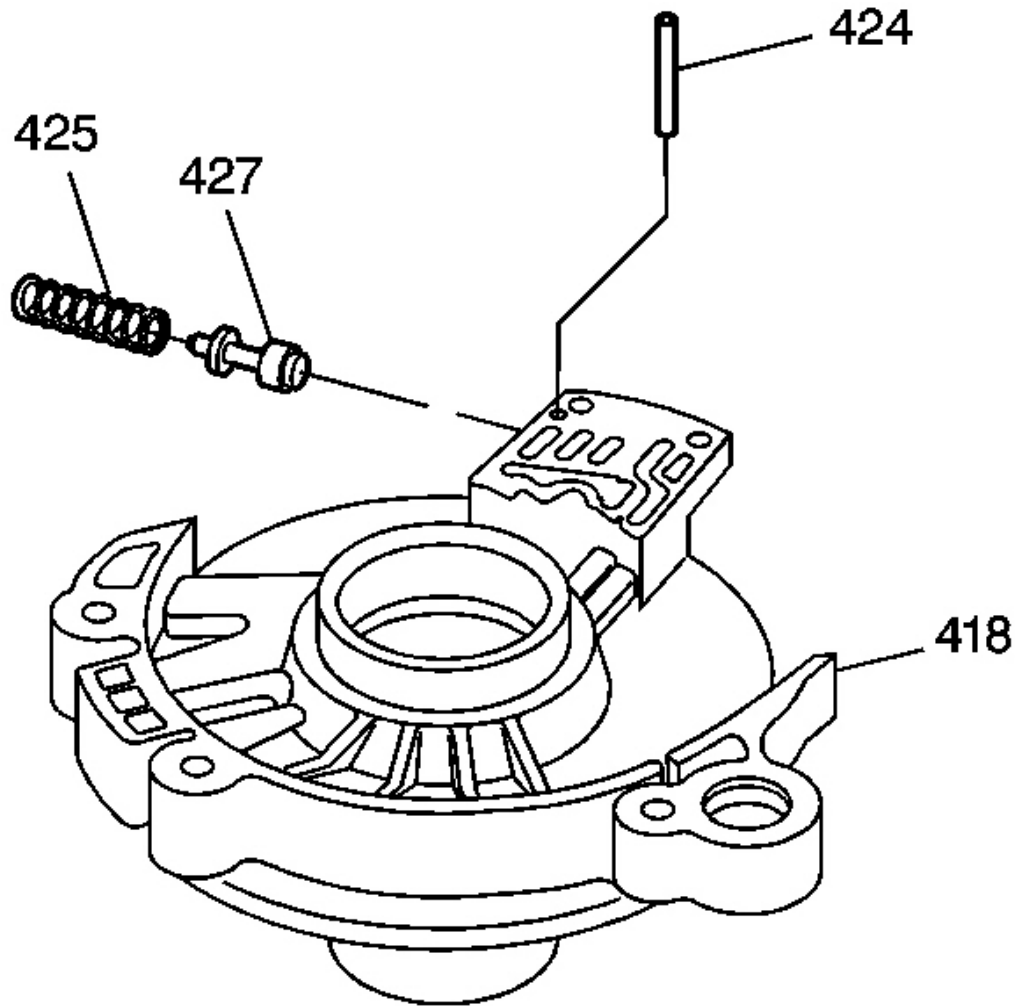


Fig. 186: Locating Third Clutch Exhaust Valve, Spring, And Pin
Courtesy of GENERAL MOTORS CORP.

10. Install the following parts:
- The third clutch exhaust valve (427)
 - The third clutch exhaust valve spring (425)
 - The spring pin (424)

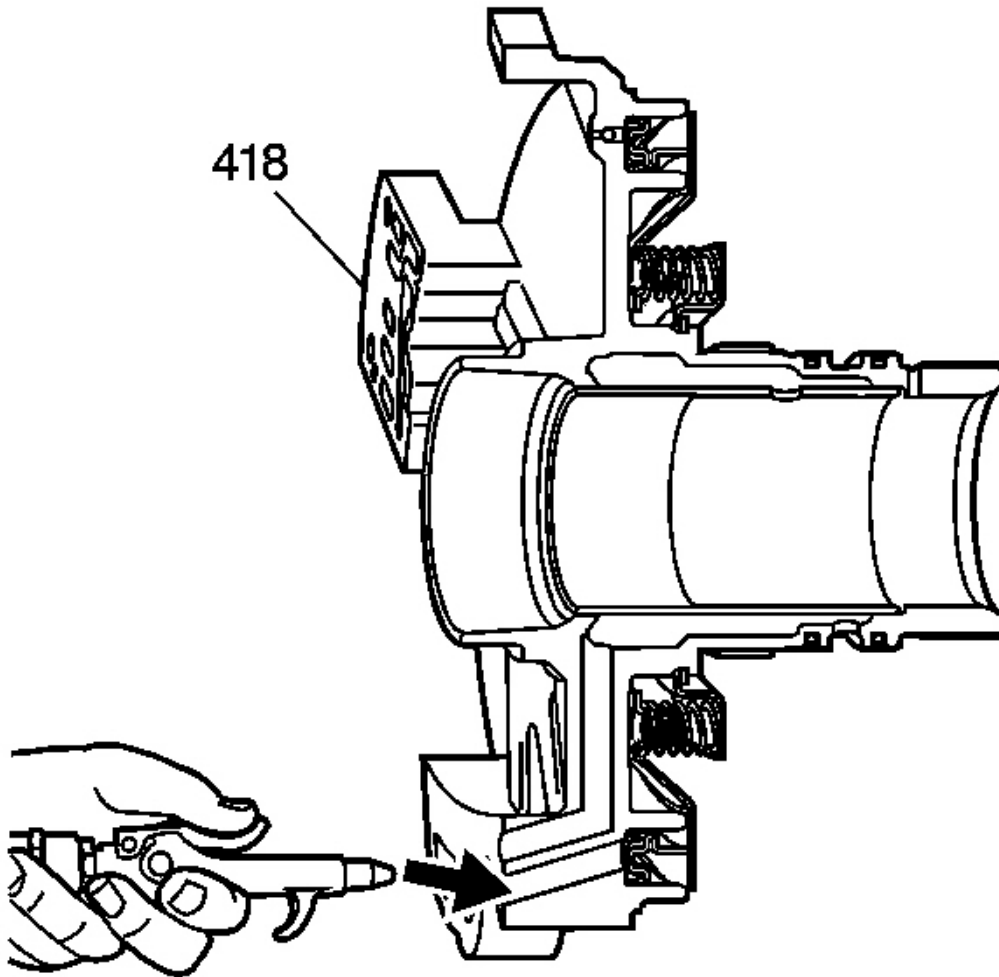


Fig. 187: Blowing Air Into Driven Sprocket Support
Courtesy of GENERAL MOTORS CORP.

11. Air check the second clutch piston by applying air through the driven sprocket support (418).

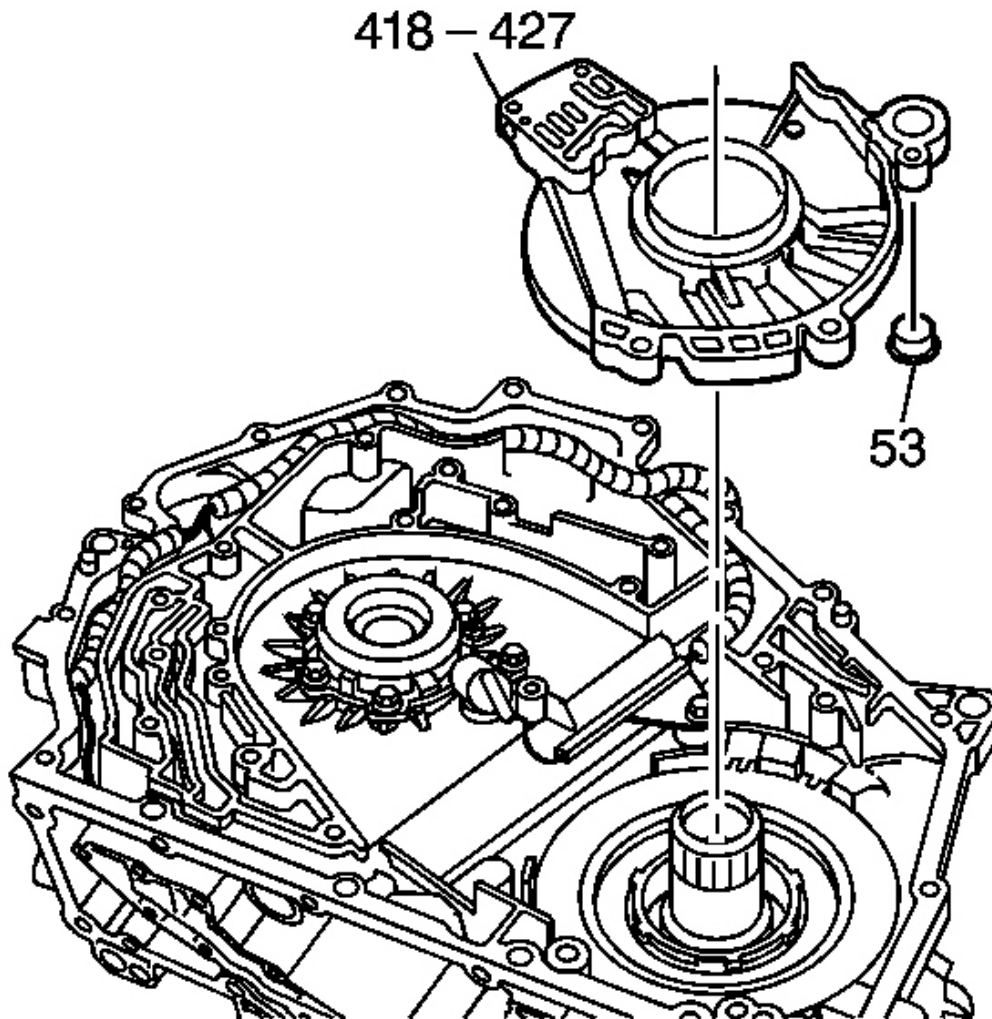


Fig. 188: Identifying Driven Sprocket Support
Courtesy of GENERAL MOTORS CORP.

12. Install the driven sprocket support (418-427) over the input shaft. When seated, the support will be flush with the case line surface.

DRIVE LINK AND SPROCKETS ASSEMBLE

Tools Required

- **J 39064-1** Drive Sprocket Shaft Seal Pusher. See Special Tools.
- **J 39064-2** Drive Sprocket Shaft Seal Sizer. See Special Tools.
- **J 39064-3** Drive Sprocket Shaft Seal Protector. See Special Tools.

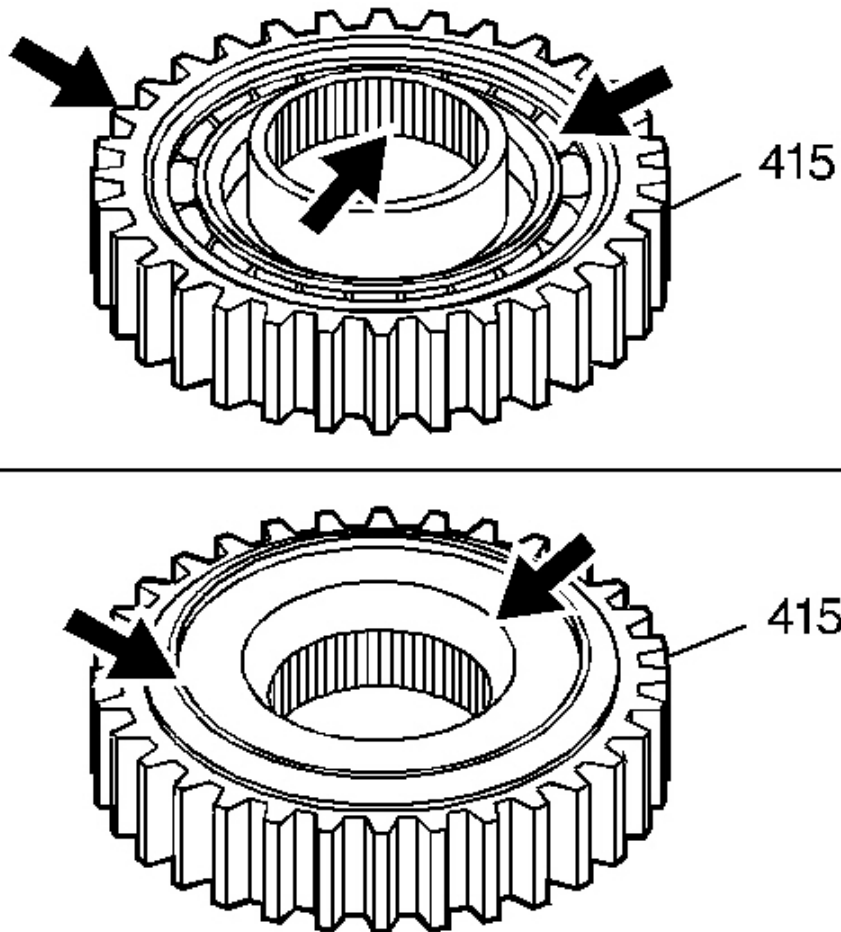


Fig. 189: Inspection Areas On Driven Sprockets
Courtesy of GENERAL MOTORS CORP.

1. Inspect the driven sprocket (415) for chipped teeth, worn splines, or a rough bearing.

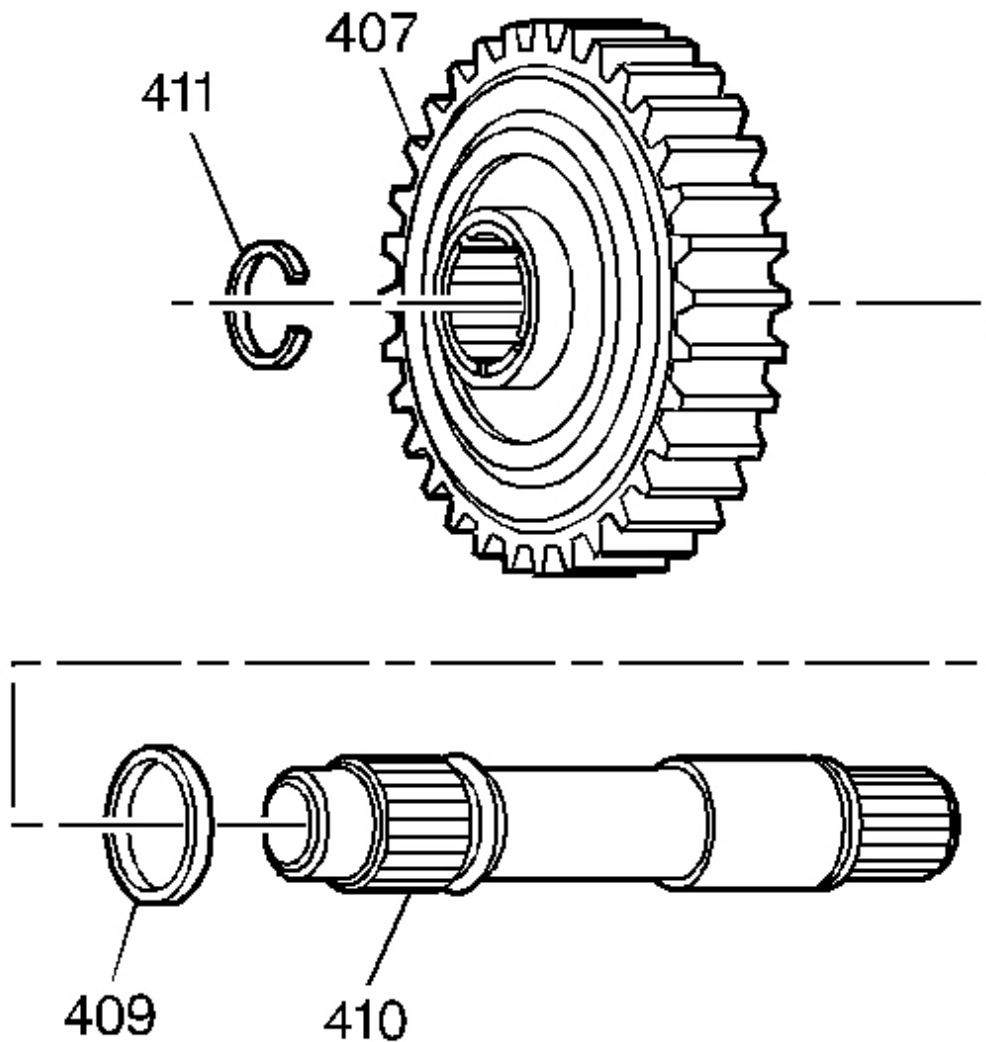


Fig. 190: Locating Drive Sprocket, Turbine Shaft & Snap Ring
Courtesy of GENERAL MOTORS CORP.

2. Remove the following parts from the turbine shaft (410):
 - The turbine shaft snap ring (411)
 - The drive sprocket (407)
 - The drive sprocket oil seal ring (409)

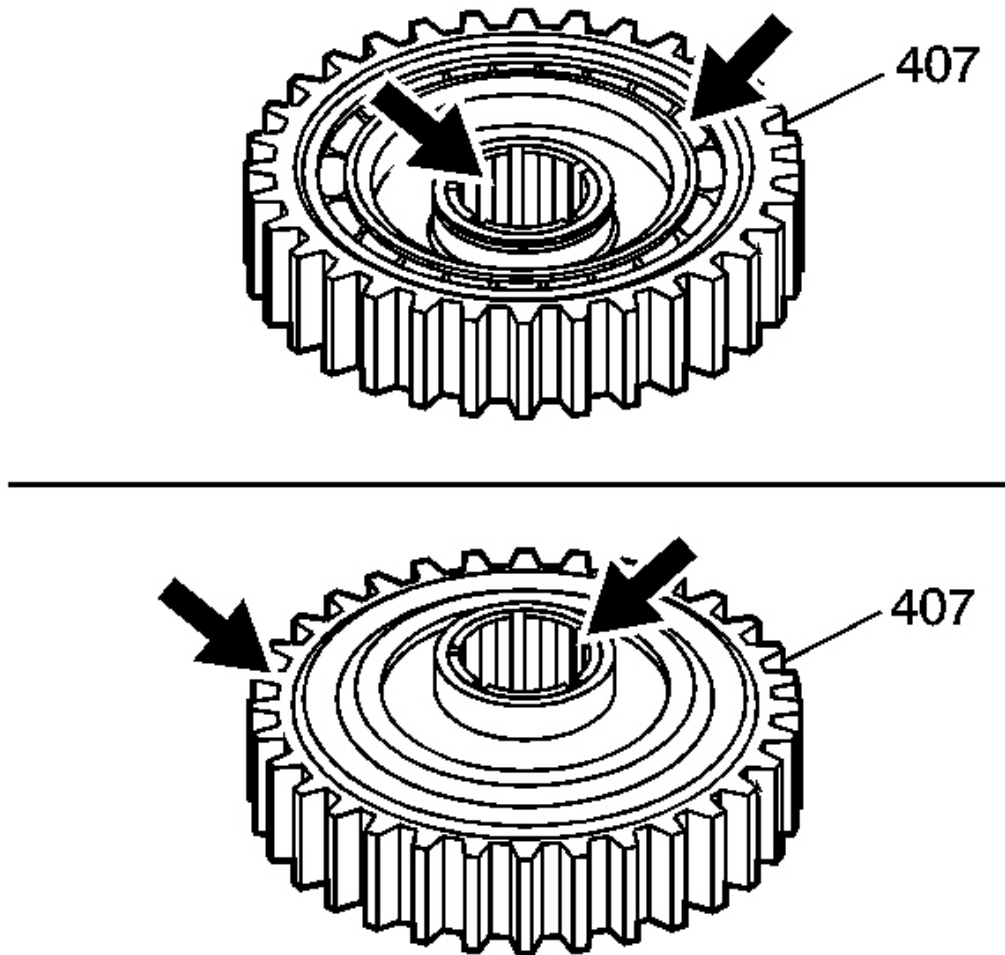


Fig. 191: View Of Drive Sprocket Inspection Areas
Courtesy of GENERAL MOTORS CORP.

3. Inspect the drive sprocket (407) for chipped teeth, worn splines, or a rough bearing.

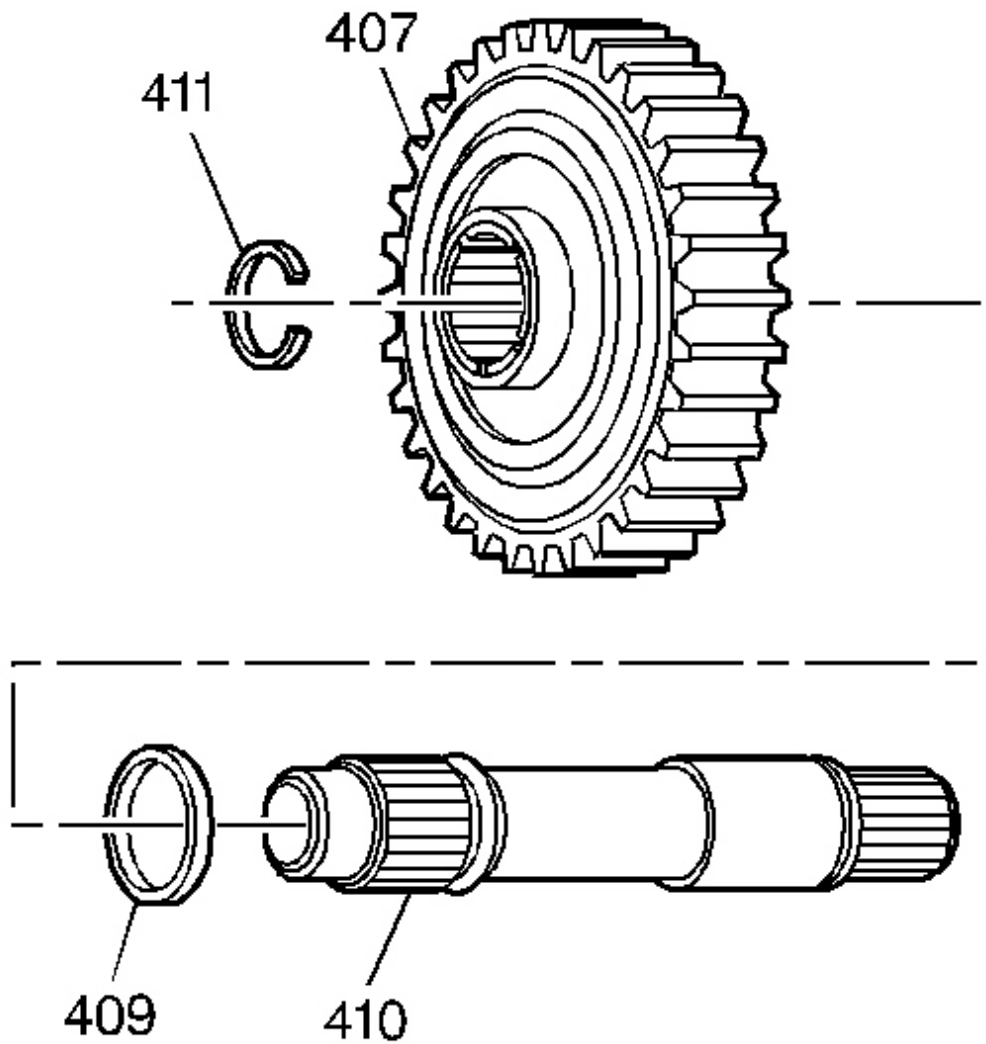


Fig. 192: Locating Drive Sprocket, Turbine Shaft & Snap Ring
Courtesy of GENERAL MOTORS CORP.

4. Install the drive sprocket (407) onto the turbine shaft (410), then install the turbine shaft snap ring (411)

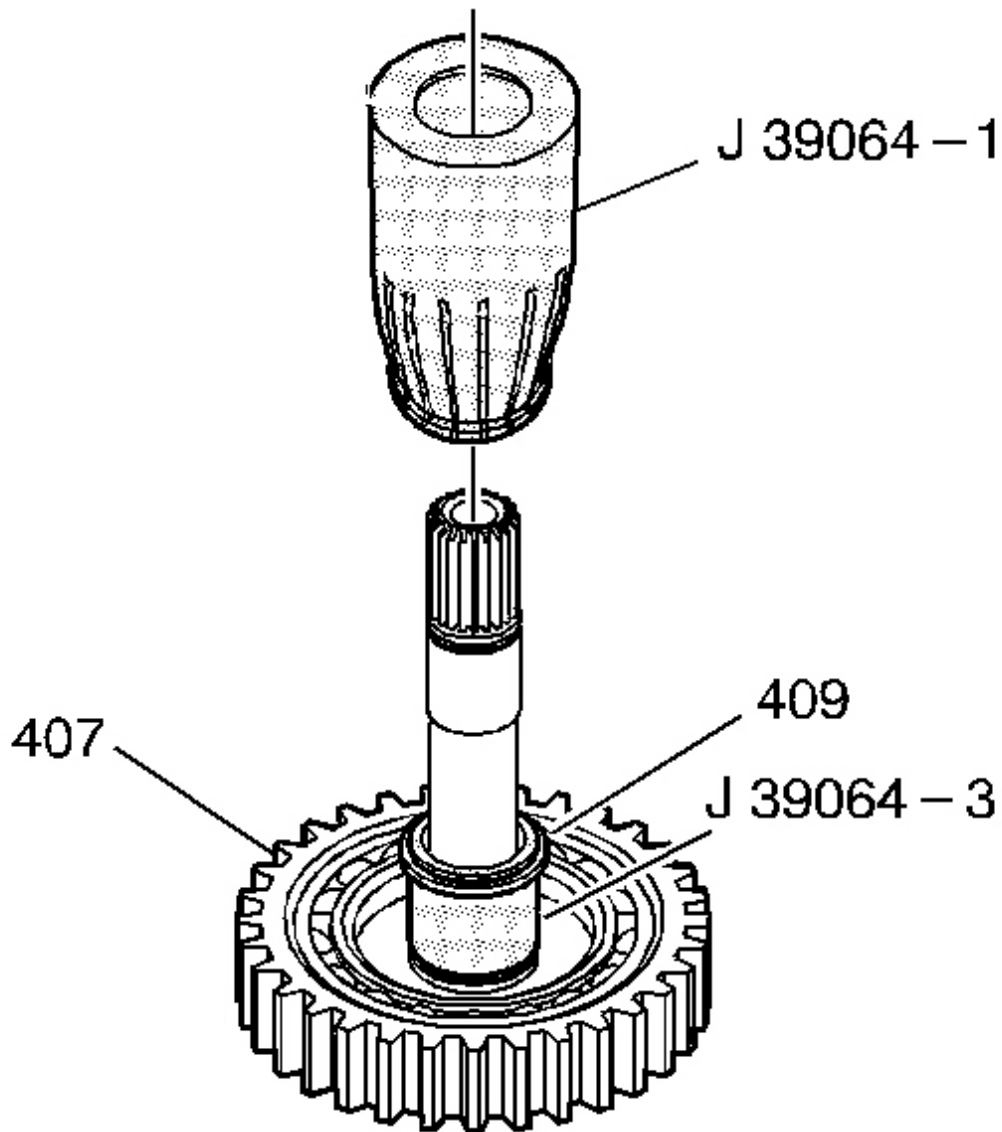


Fig. 193: Installing Drive Sprocket Oil Seal Ring With J 39064-3
Courtesy of GENERAL MOTORS CORP.

5. Lubricate the drive sprocket oil seal ring (409) with transmission fluid.
6. Install the drive sprocket oil seal ring (409) onto the **J 39064-3** . See **Special Tools**.
7. Place the **J 39064-3** onto the drive sprocket (407). See **Special Tools**. Using the **J 39064-**

1 , quickly push down and install the drive sprocket oil seal ring (409). See **Special Tools**.

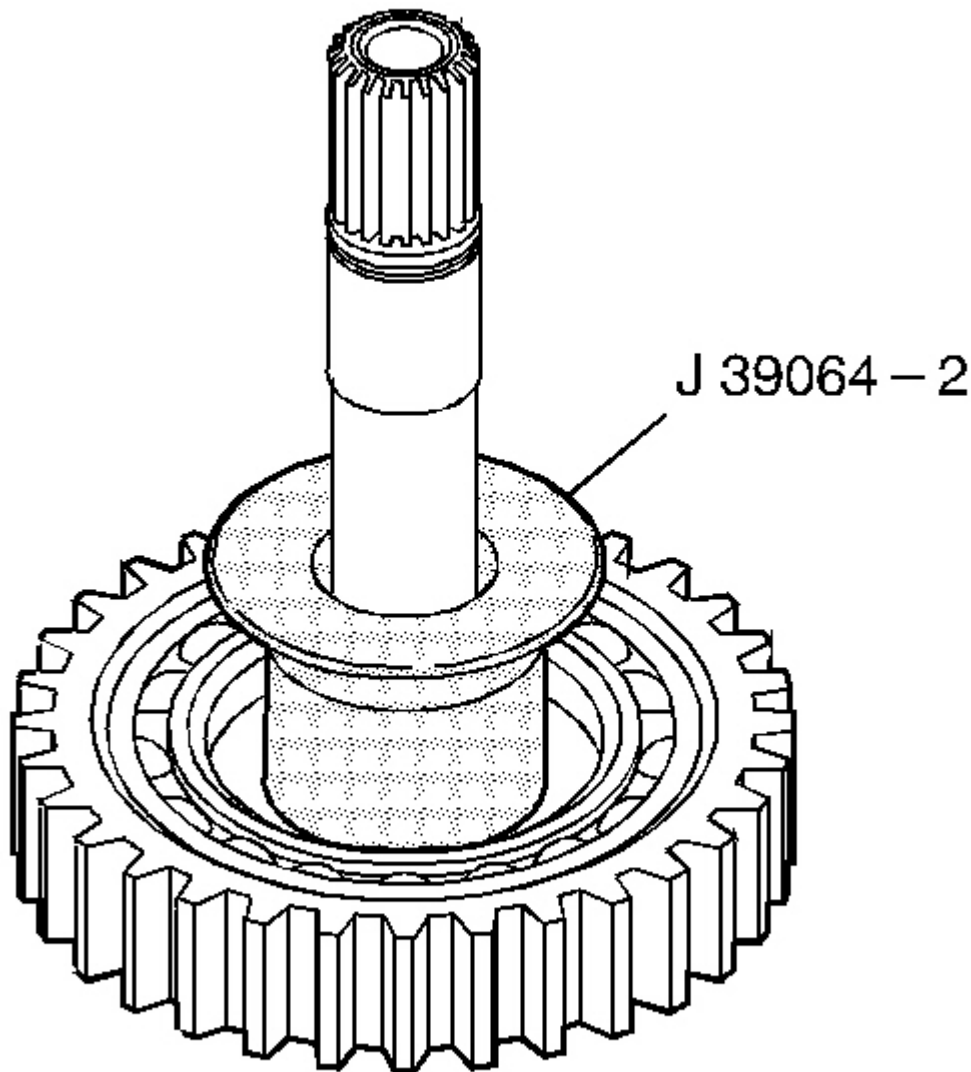


Fig. 194: Placing J 39064-2 Over The Drive Sprocket Oil Seal Ring
Courtesy of GENERAL MOTORS CORP.

8. Remove the **J 39064-1** . See **Special Tools**. Place the **J 39064-2** over the drive sprocket oil seal ring. See **Special Tools**. Leave the **J 39064-2** in place until ready to install the turbine shaft into the drive sprocket support. See **Special Tools**.

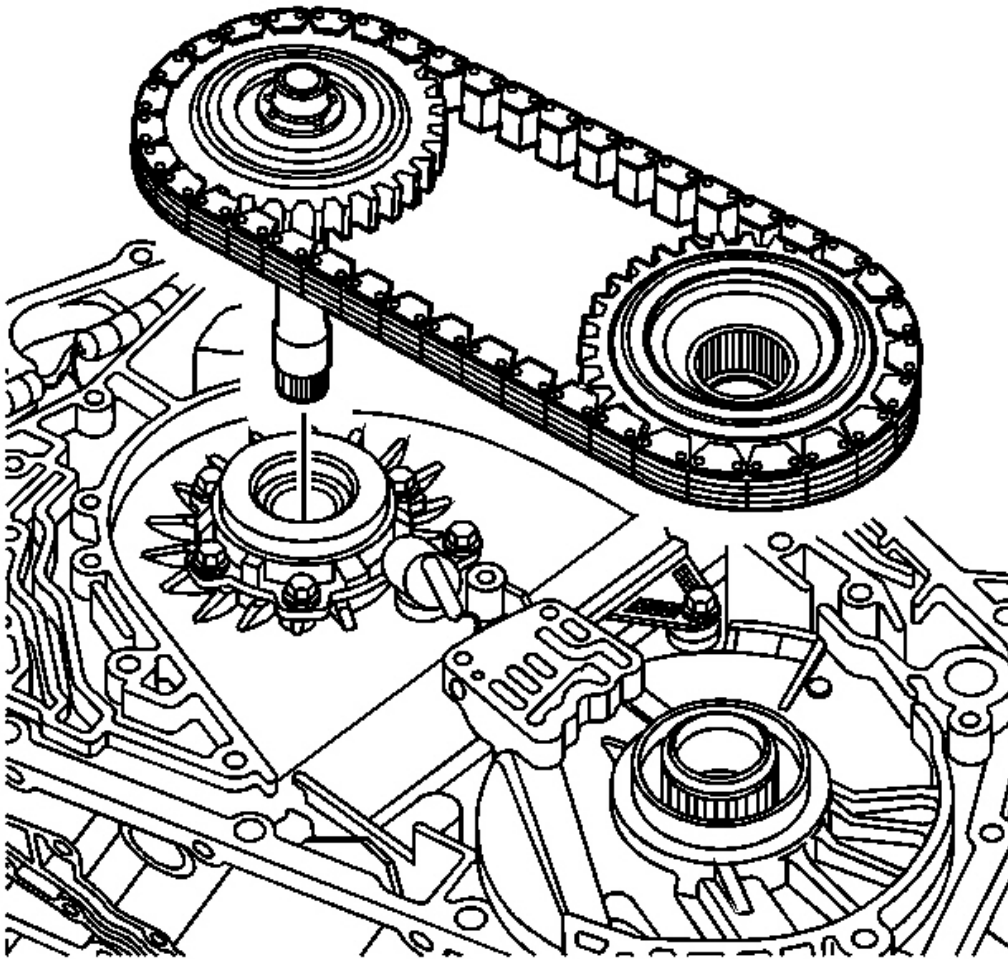


Fig. 195: View Of Drive Chain To The Drive And Driven Sprockets
Courtesy of GENERAL MOTORS CORP.

9. Remove the J 39064-2 from the drive sprocket oil seal ring. See Special Tools.

IMPORTANT: The drive chain must be oriented in the same direction it was in when removed.

10. Attach the drive chain to the drive and driven sprockets.
11. Install the drive sprocket and turbine shaft into the drive sprocket support. Line up the driven sprocket splines with the input shaft and evenly tap the drive and driven sprockets

into place until seated.

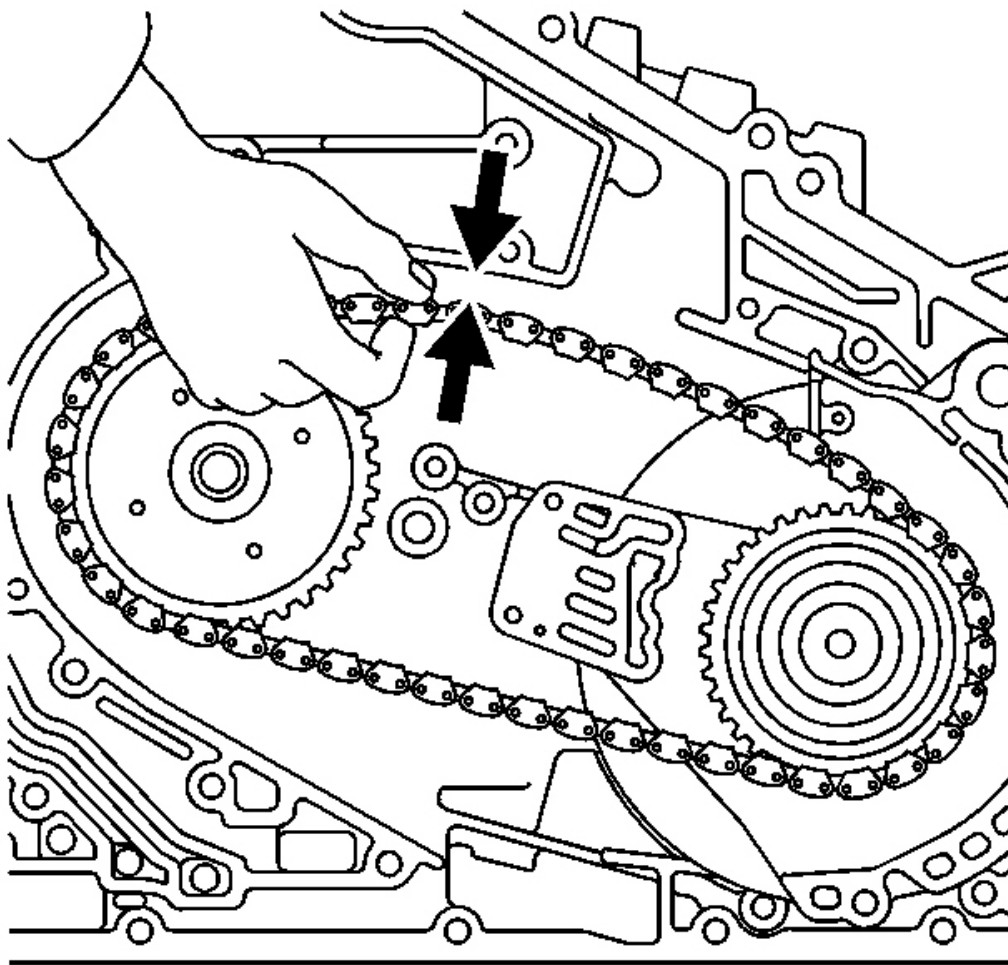


Fig. 196: Measuring Drive Chain To Case Rib Clearance
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: If the clearance is less than 12.7 mm (0.5 in), replace the drive chain.

12. Measure the drive chain to case rib clearance. The clearance should be no less than 12.7 mm (0.5 in).

THRUST BEARINGS INSTALLATION

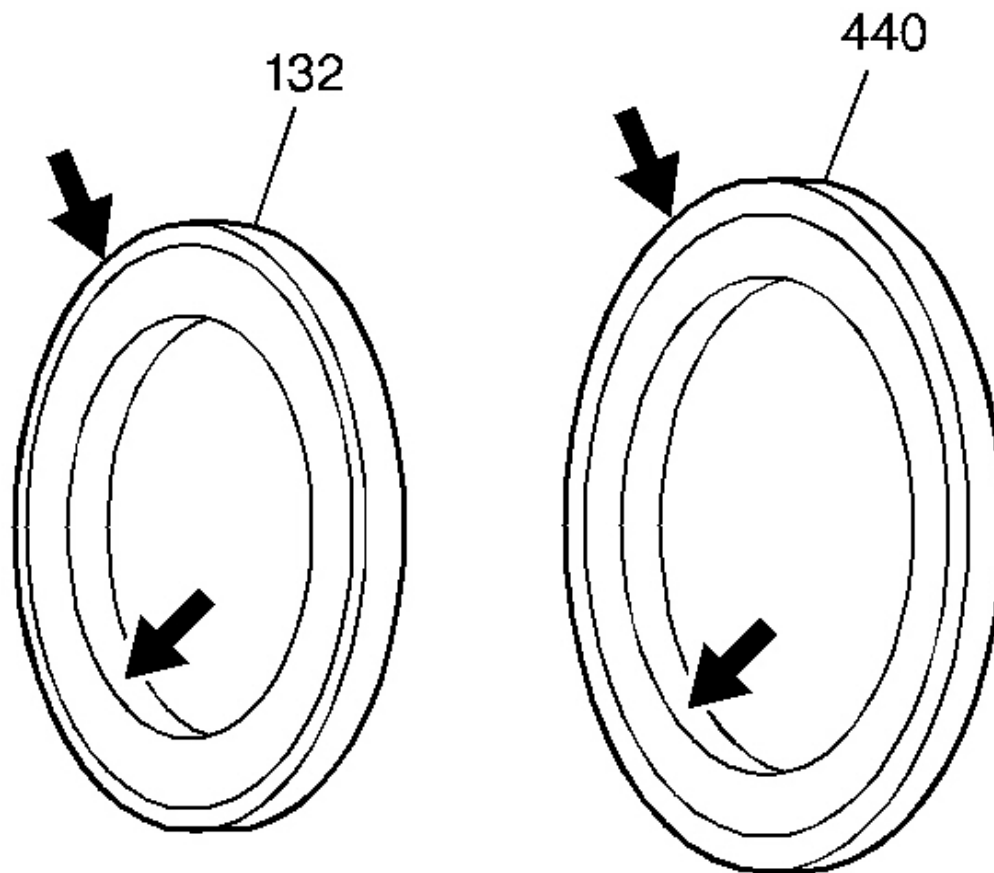


Fig. 197: View Of Drive & Driven Sprocket Thrust Bearing
Courtesy of GENERAL MOTORS CORP.

1. Inspect the drive sprocket thrust bearing (132) and the driven sprocket thrust bearing (440) for damage.

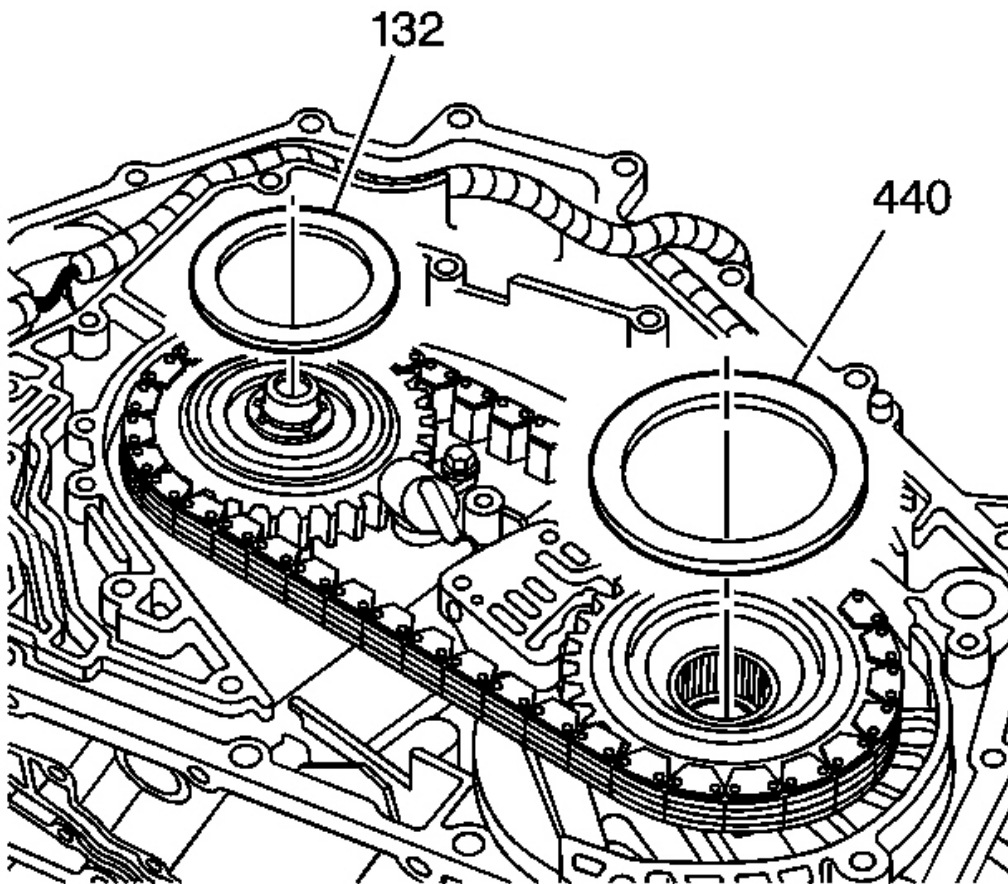


Fig. 198: Locating Drive And Driven Sprocket Thrust Bearings
Courtesy of GENERAL MOTORS CORP.

2. Install the drive and driven sprocket thrust bearings (132, 440) onto the sprockets.

CASE COVER/TURBINE SHAFT SEAL REPLACEMENT

Tools Required

- **J 7079-2** Universal Driver Handle-Non Threaded
- **J 8092** Driver Handle
- **J 39062** Turbine Shaft Seal Tool. See **Special Tools**.
- **J 39648** Drive Sprocket Seal Installer. See **Special Tools**.

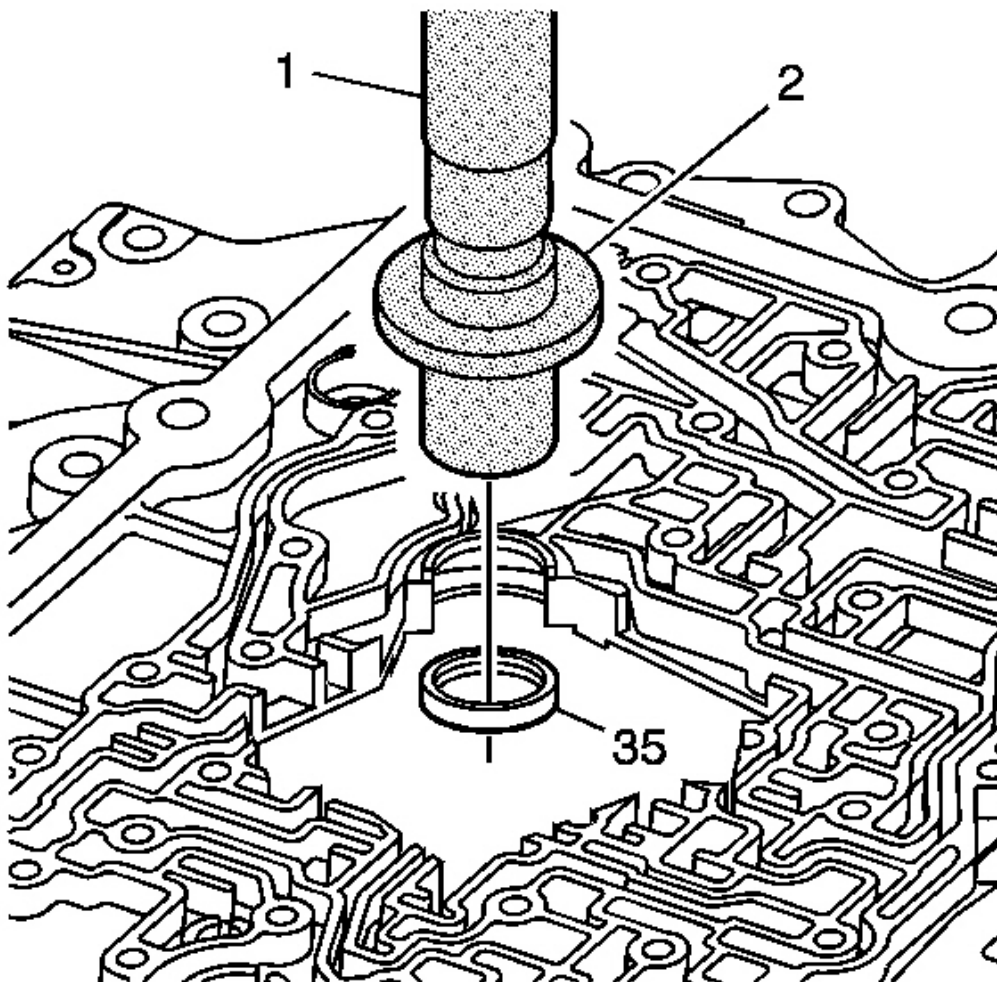


Fig. 199: Removing The Case Cover To Turbine Shaft Seal Using J 7079-2 & J 39062

Courtesy of GENERAL MOTORS CORP.

1. Using **J 7079-2** (1) and the remover side of the **J 39062** (2), remove the case cover to turbine shaft seal (35). See **Special Tools**.

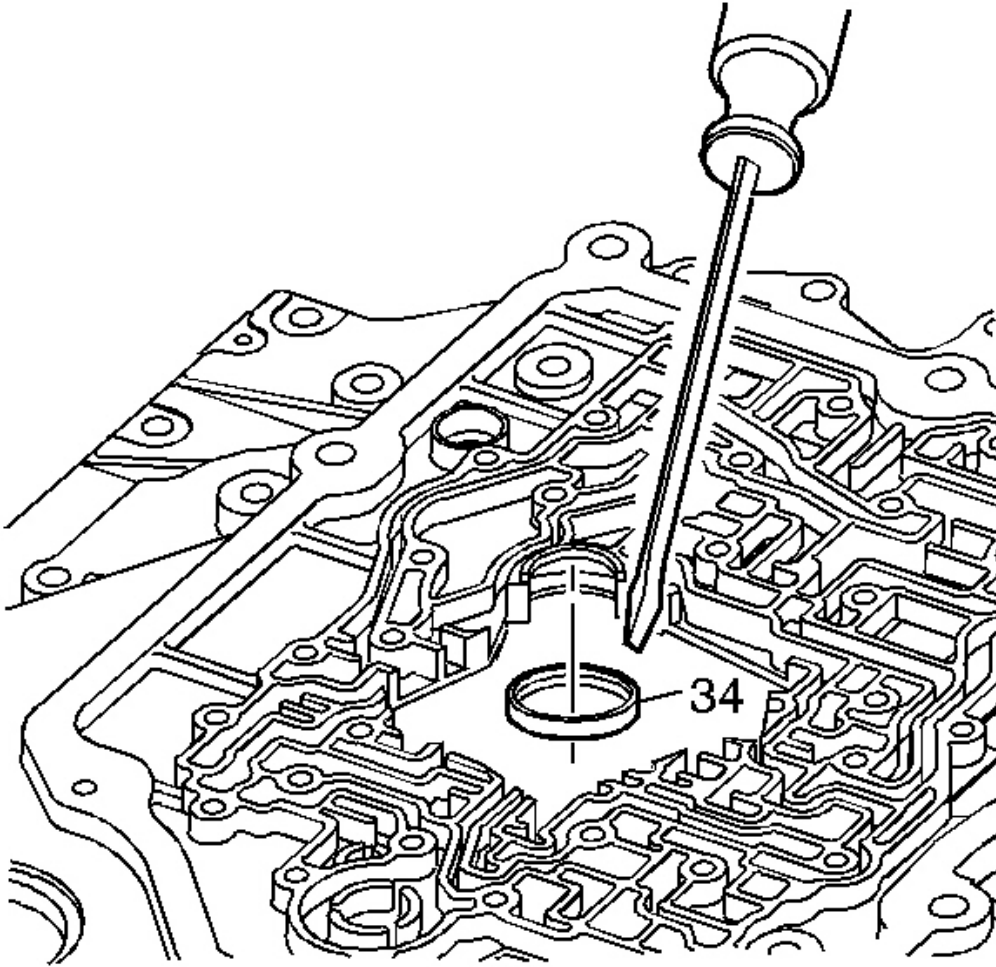


Fig. 200: Removing Case Cover To Drive Sprocket Seal
Courtesy of GENERAL MOTORS CORP.

2. Using a small screwdriver, remove the case cover to drive sprocket seal (34) by tapping the seal out through the slots in the case cover.

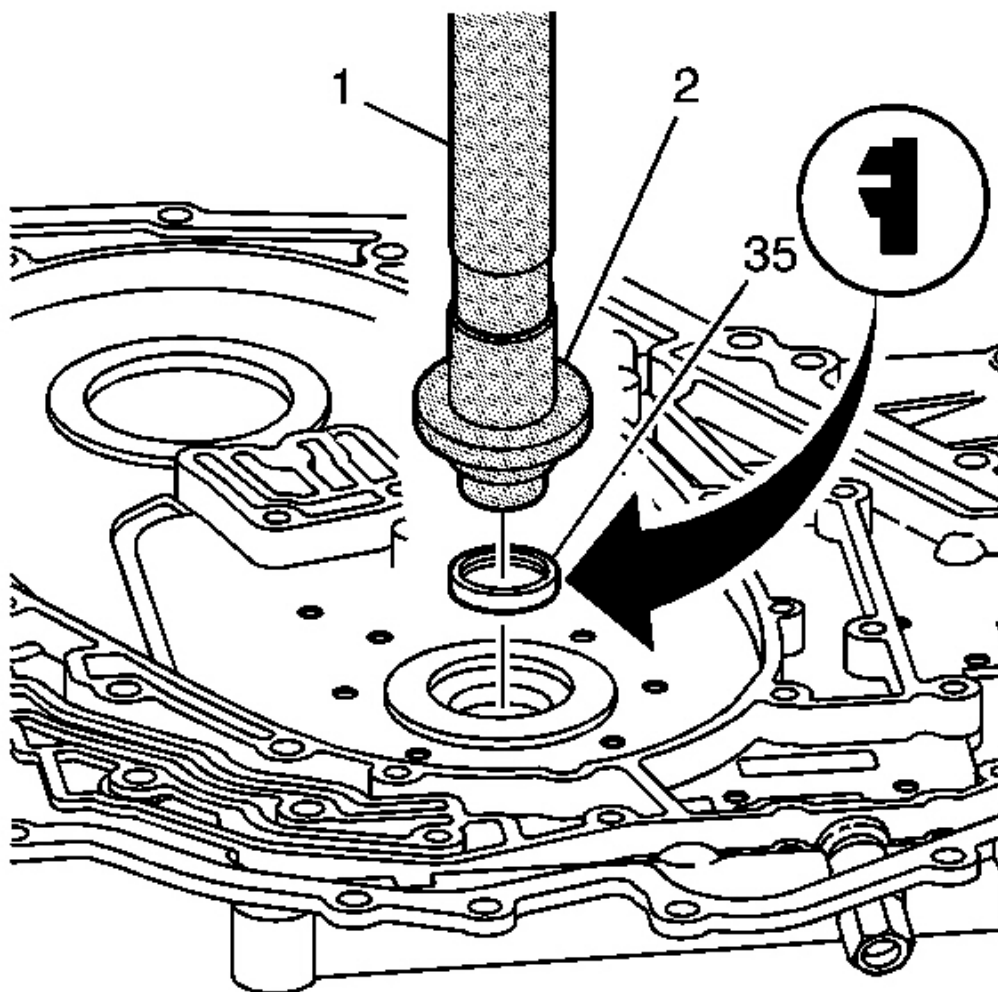


Fig. 201: Installing The Case Cover To Turbine Shaft Seal Using J 39062
Courtesy of GENERAL MOTORS CORP.

3. Using **J 7079-2** (1) the installer side of the **J 39062** (2), install the case cover to turbine shaft seal (35). See **Special Tools**.

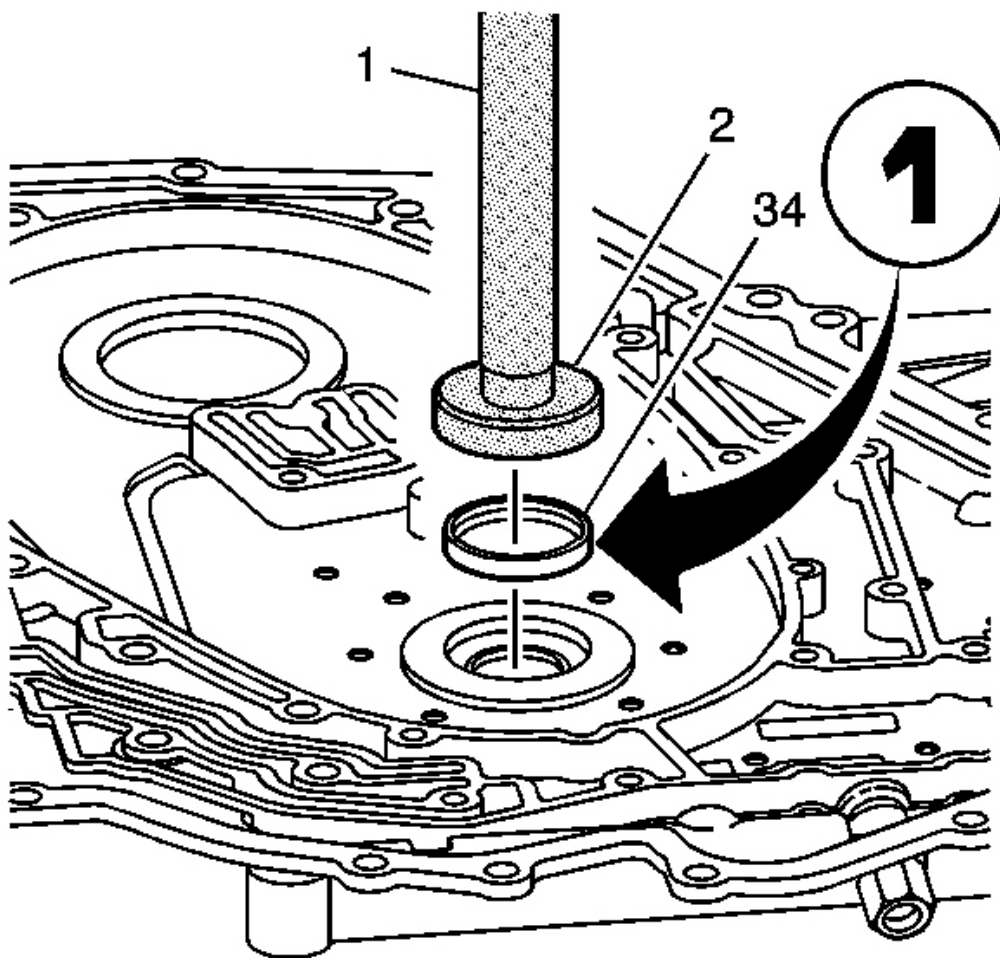


Fig. 202: Installing The Case Cover To Drive Sprocket Seal Using J 8092
Courtesy of GENERAL MOTORS CORP.

4. Using **J 8092** (1) and **J 39648** (2), install the case cover to drive sprocket seal (34). See **Special Tools**.

CASE COVER ASSEMBLY INSTALLATION

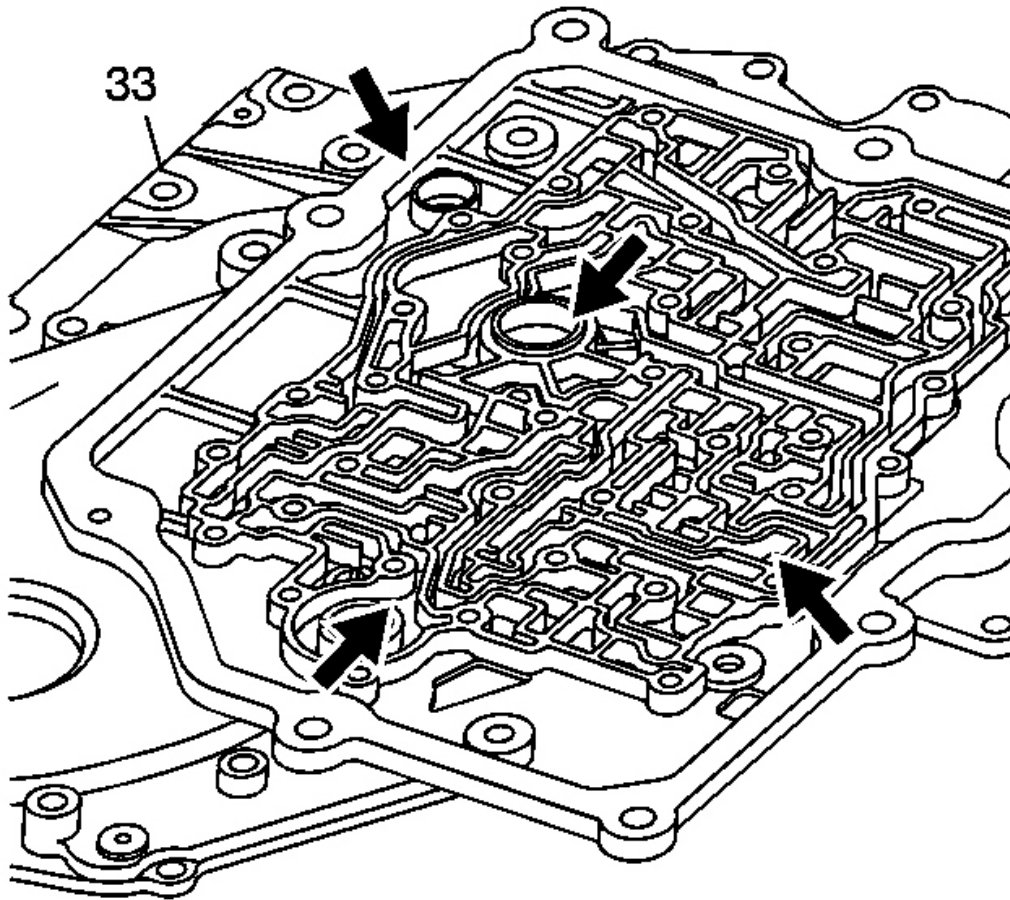


Fig. 203: Identifying Case Cover Mating Surface Inspection Areas
Courtesy of GENERAL MOTORS CORP.

1. Inspect the case cover (33) mating surfaces for nicks, burrs, or damage.

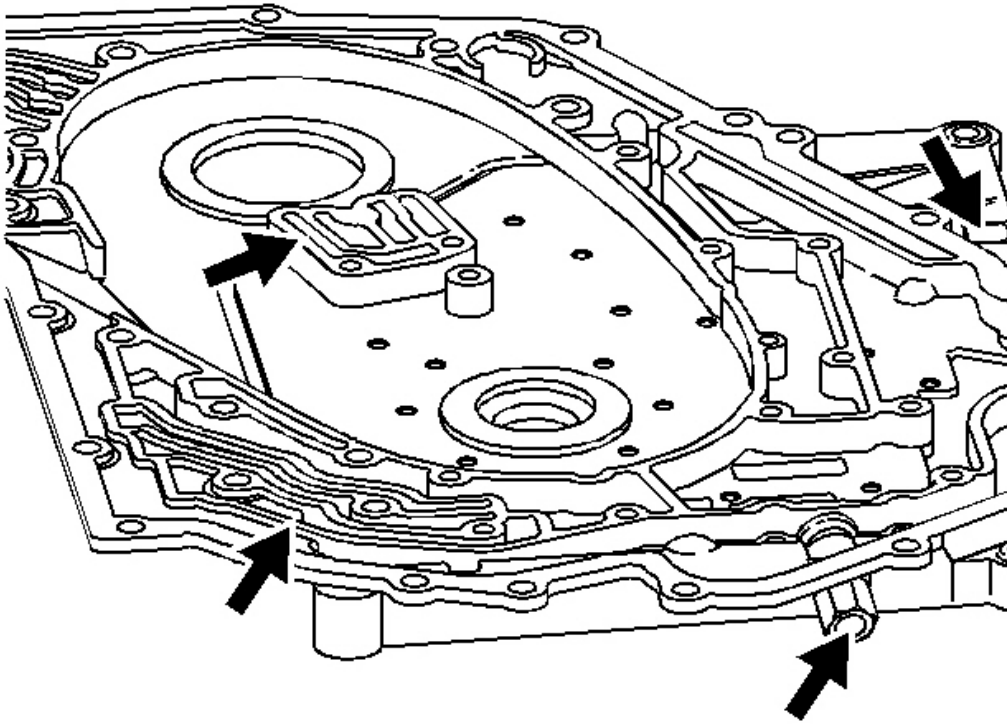


Fig. 204: Case Cover Inspection Points
Courtesy of GENERAL MOTORS CORP.

2. Inspect the case cover to case mating surfaces for nicks, burrs, or damage.
3. Inspect the cooler fitting and inspect the seal for damage.

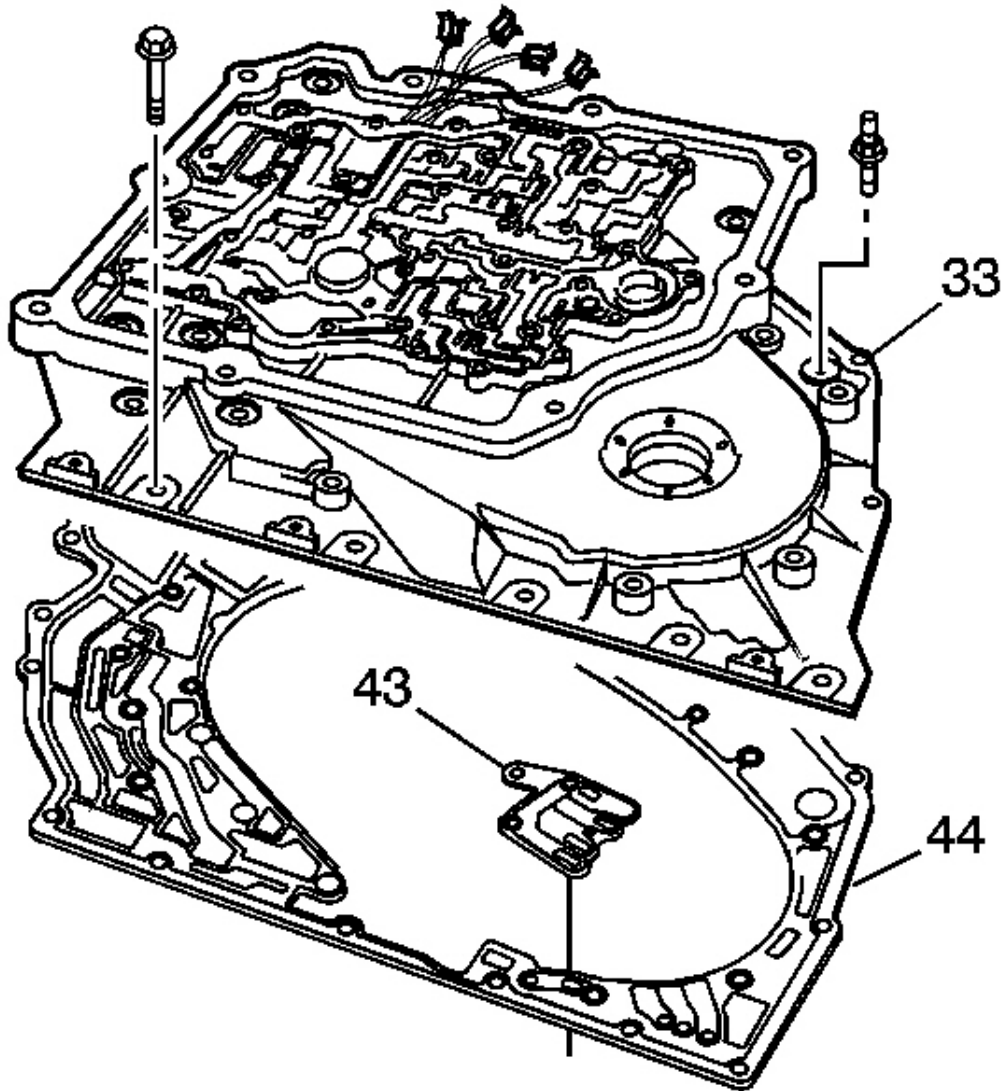


Fig. 205: View Of Island Gasket & Case Cover Gasket
Courtesy of GENERAL MOTORS CORP.

4. Install the new island gasket (43) and the new case cover gasket (44) over the dowel pins on the case. Pass the wiring harness through the large opening at the top of the case cover gasket. Make sure that the wiring harness remains under the gasket, except for the portion where the connectors are attached.

5. Install the case cover assembly (33). Pass the wiring harness assembly through the opening at the top of the case cover. Do not pinch the wires.

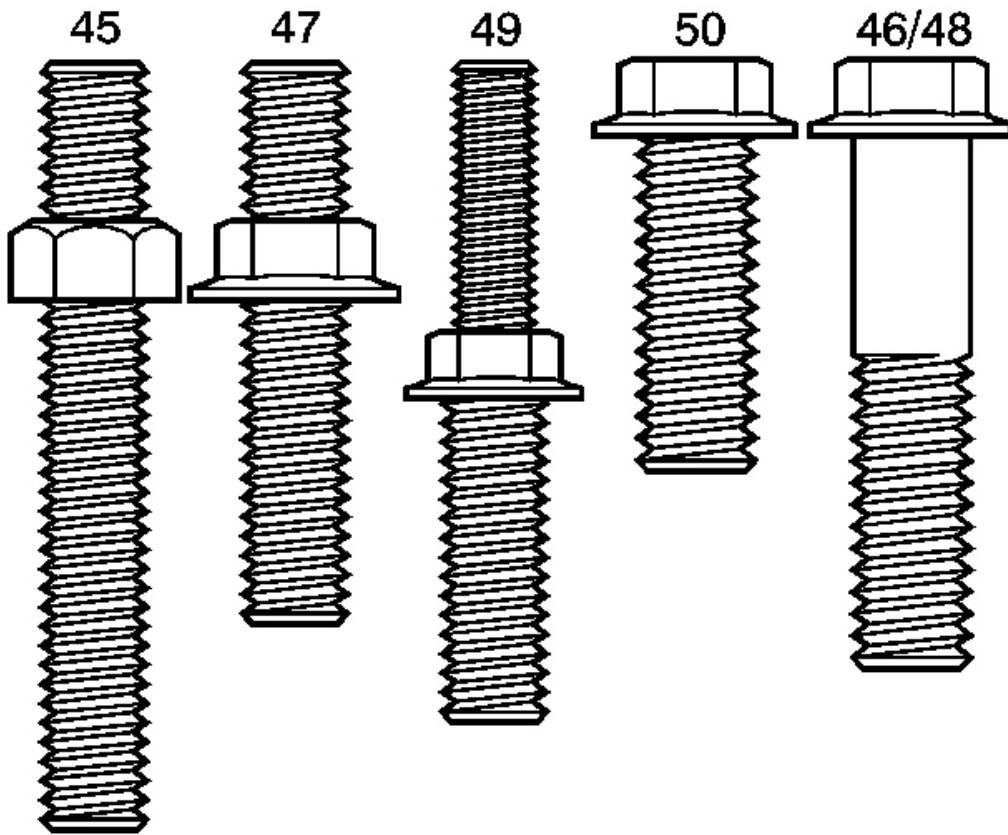


Fig. 206: Identifying Case Cover Bolts
Courtesy of GENERAL MOTORS CORP.

6. Install the case cover bolts (45-50), and hand tighten the bolts.

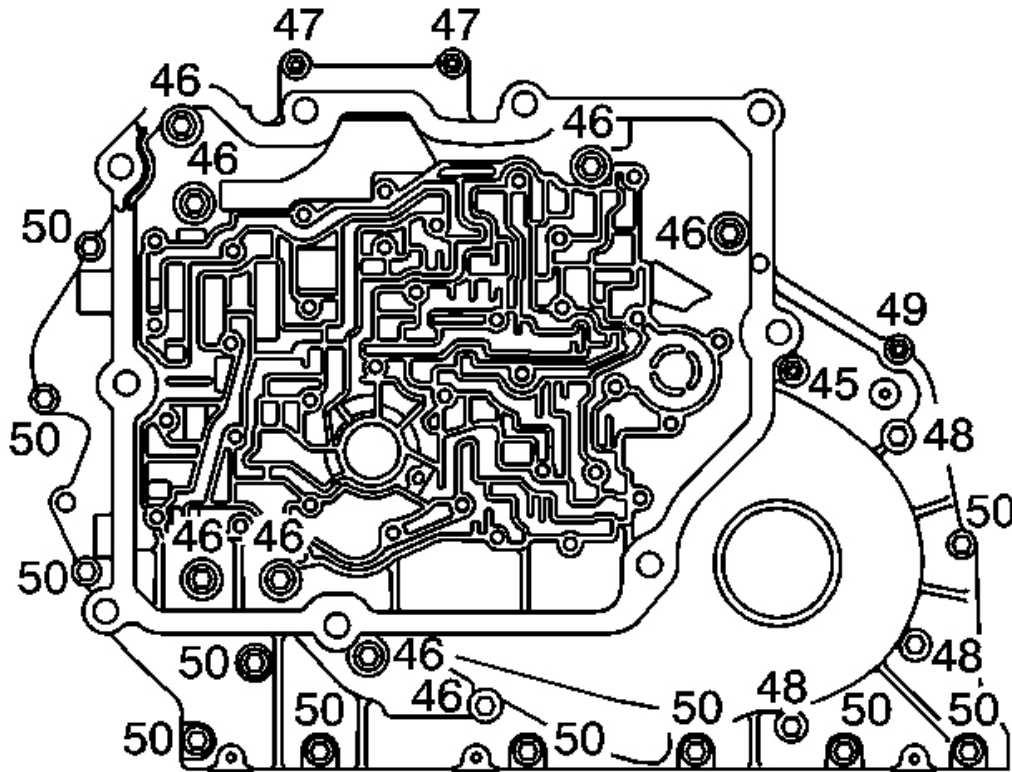


Fig. 207: Illustrating Case Cover Bolt/Stud Locations
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to FASTENER NOTICE in Cautions and Notices.

7. Tighten the case cover to case bolts.

Tighten:

- Tighten case cover to case stud (45) to 20-27 N.m (15-20 lb ft).
- Tighten case cover to case bolt (46) to 20-27 N.m (15-20 lb ft).
- Tighten case cover to case stud (47) to 27-31 N.m (20-23 lb ft).
- Tighten case cover to driven sprocket support bolt (48) to 20-27 N.m (15-20 lb ft).
- Tighten case cover to case stud (49) to 27-31 N.m (20-23 lb ft).
- Tighten case cover to case bolt (50) to 27-31 N.m (20-23 lb ft).

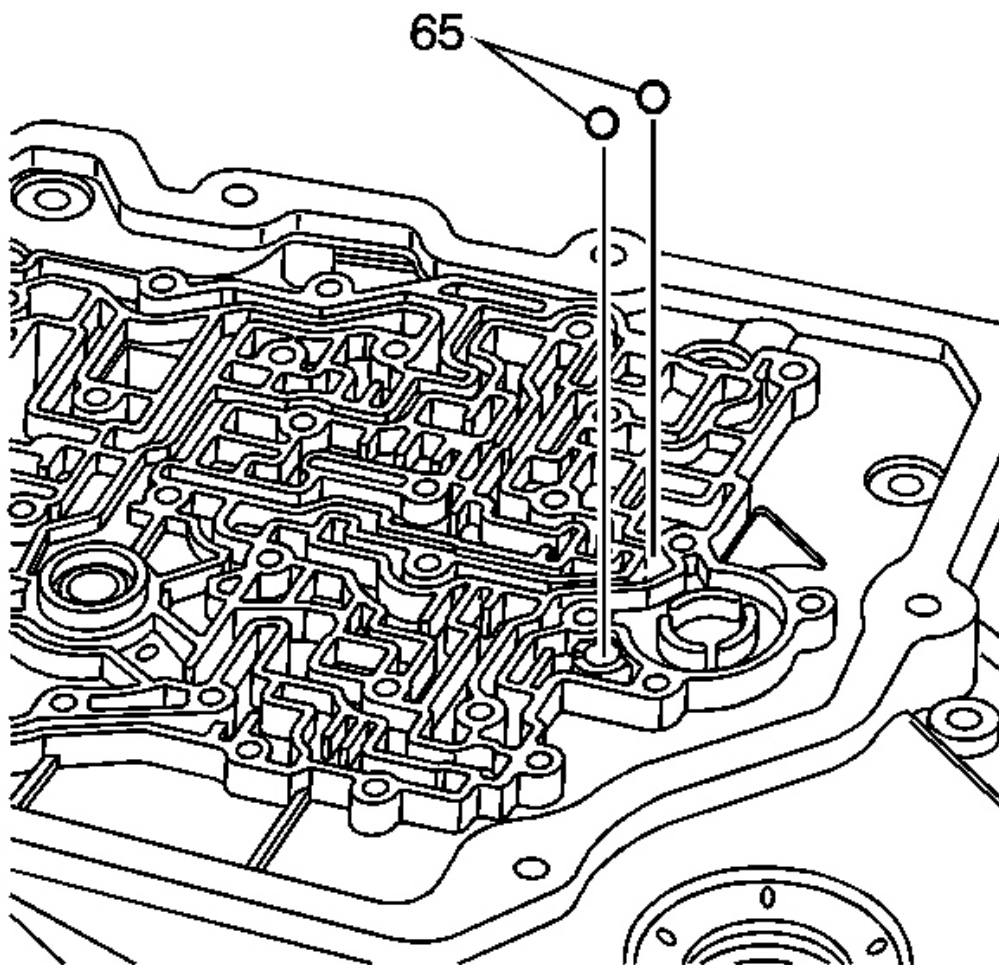


Fig. 208: Identifying Case Cover Checkballs
Courtesy of GENERAL MOTORS CORP.

8. Install the two checkballs (65).

ASSEMBLY END PLAY MEASUREMENT

Tools Required

- **J 39686** Input End Play Check Tool. See Special Tools.
- **J 8001** Dial Indicator Set

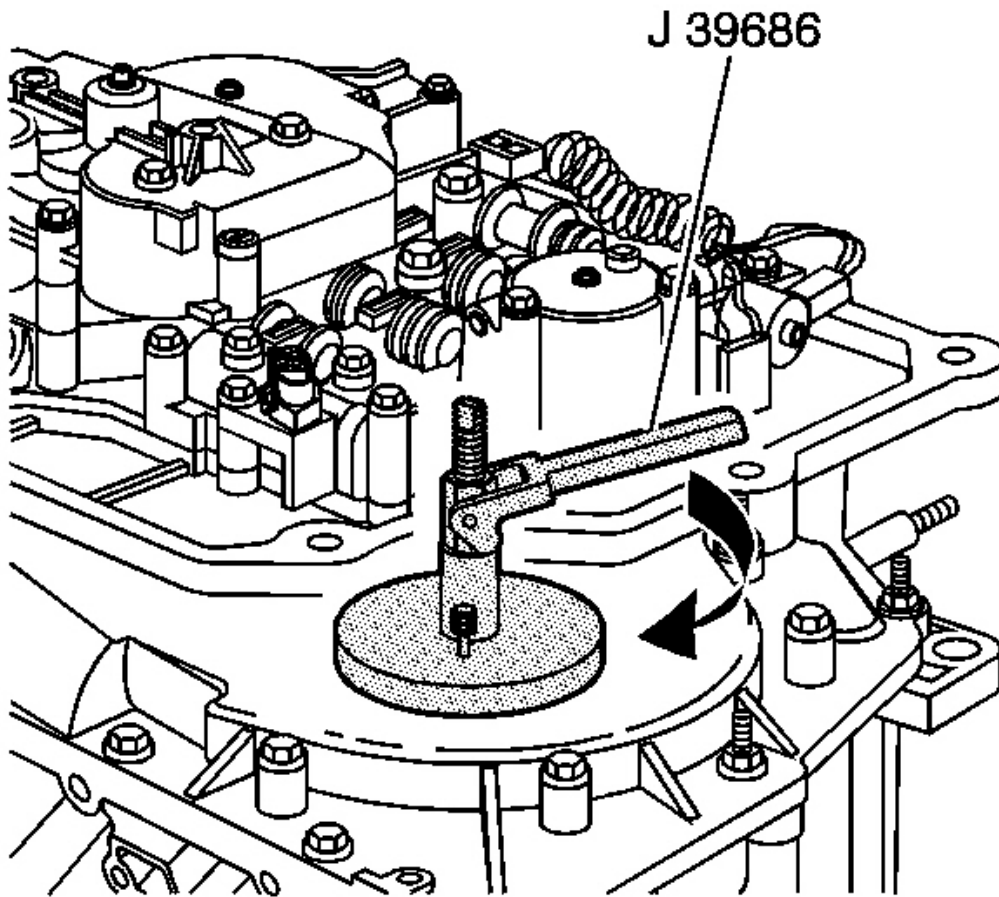


Fig. 209: Installing J 39686 Into The Case Barrel
Courtesy of GENERAL MOTORS CORP.

1. Install the **J 39686** into the case barrel and install the post. See **Special Tools**.

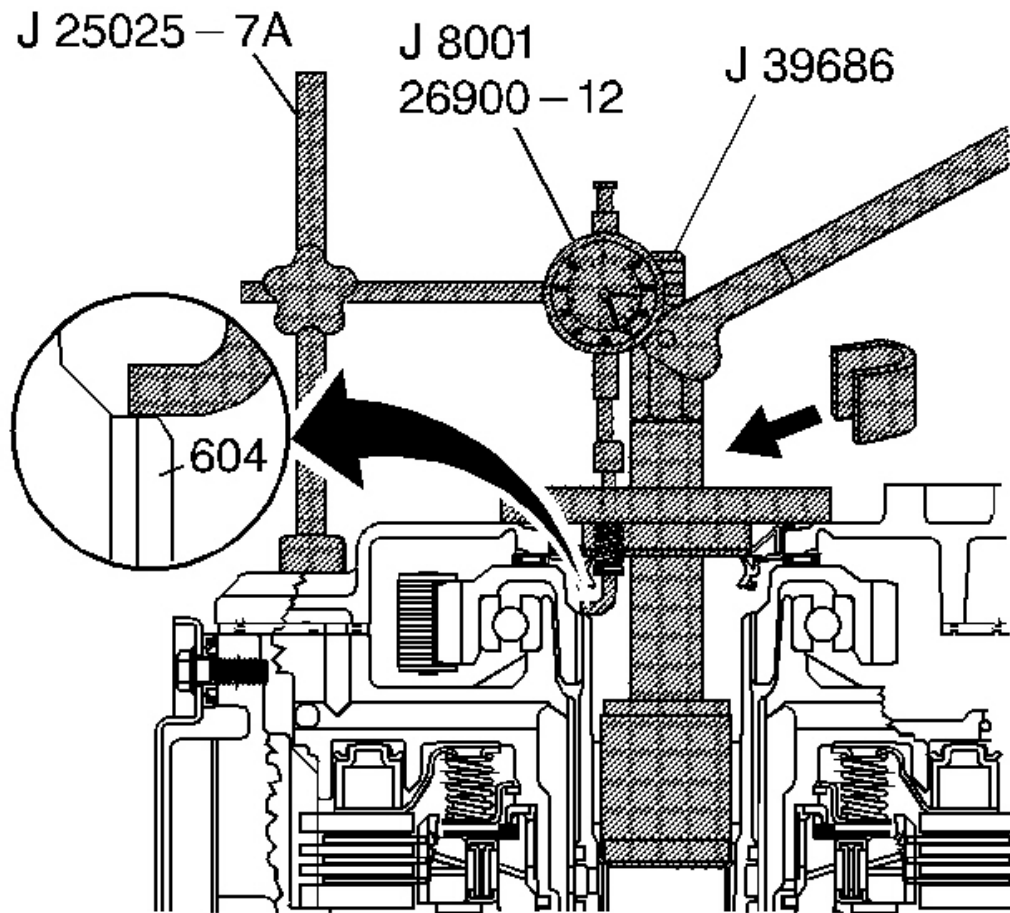


Fig. 210: Locating The J Tab On The Input Shaft
Courtesy of GENERAL MOTORS CORP.

2. Locate the J tab on the input shaft (604). The arrow on the tab should have a 90 degree orientation.
3. The washer must rest flat on the case cover seal. Rotate the threaded shaft clockwise until tight. Leave enough space for the collar.
4. Insert the collar. Install the **J 8001** .

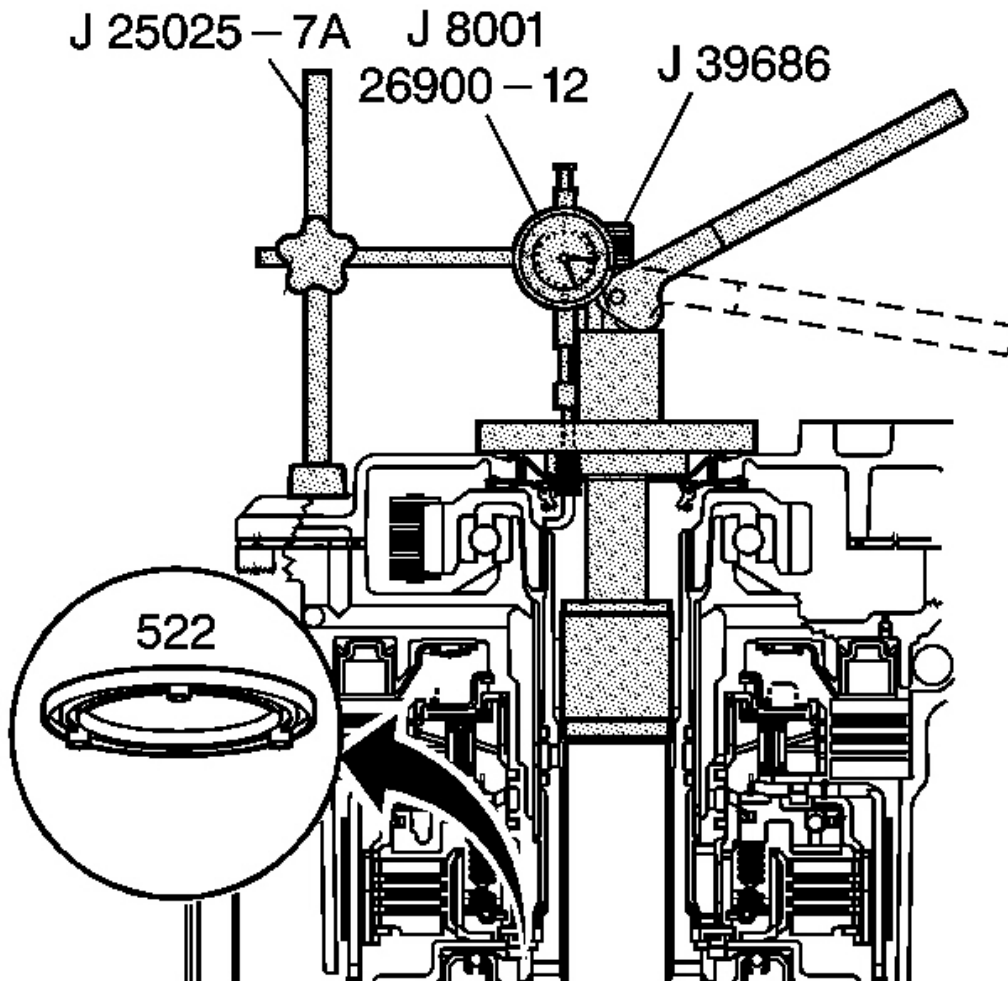


Fig. 211: Checking End Play Using J 39686
Courtesy of GENERAL MOTORS CORP.

5. Push down on the handle and check the end play.

Specification: The end play specification is 0.10-0.85 mm (0.004-0.033 in).

If the measurement is out of the specification range, determine the appropriate selective thrust washer (522) for installation upon reassemble.

6. Remove the dial indicator and the post.

UPPER CONTROL VALVE BODY DISASSEMBLE

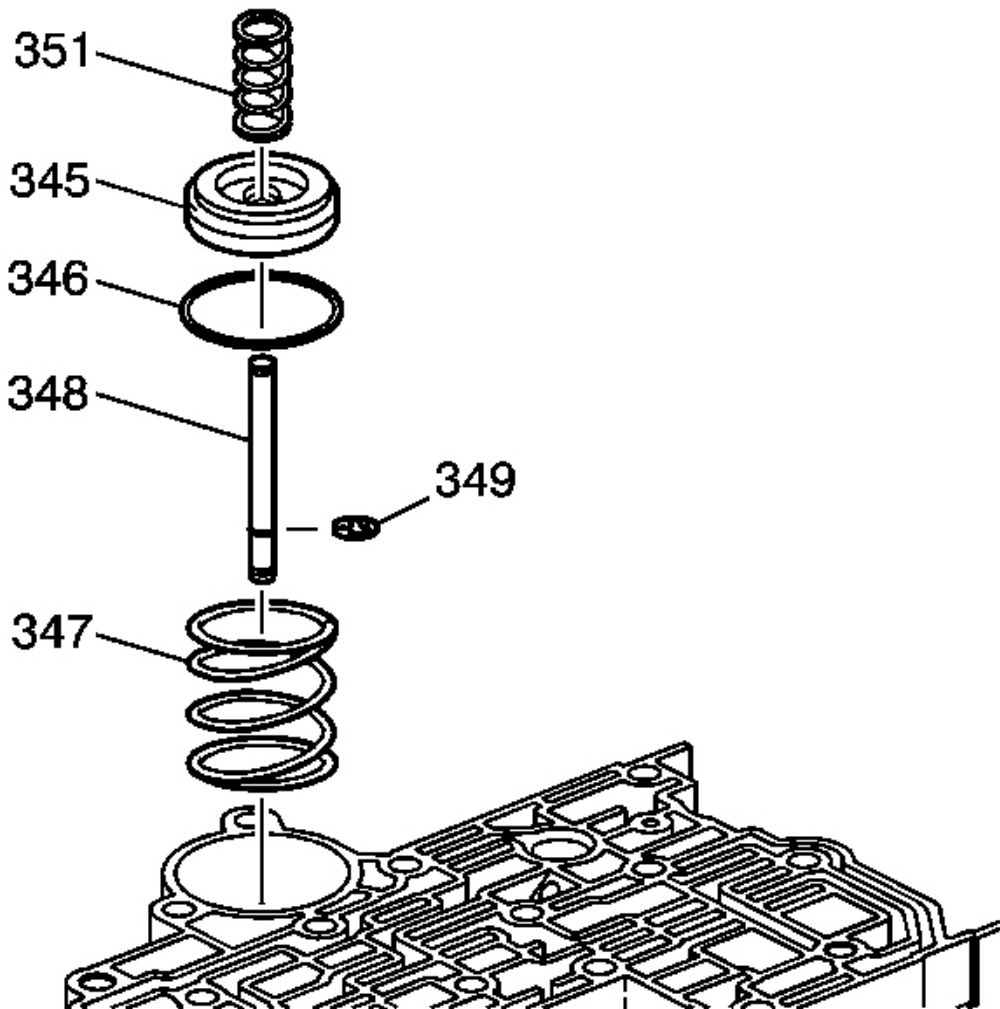


Fig. 212: Identifying 2-3 Accumulator Piston Components
Courtesy of GENERAL MOTORS CORP.

1. Remove the 2-3 piston cushion spring (351). Inspect the spring for damage.
2. Remove the 2-3 accumulator piston (345) and seal (346). Inspect the seal for roll over or any other type of damage. Inspect the piston for nicks or scratches.
3. Remove the snap ring (349), remove the 2-3 accumulator pin (348), and the 2-3 accumulator piston spring. Inspect the snap ring and the piston pin for damage.

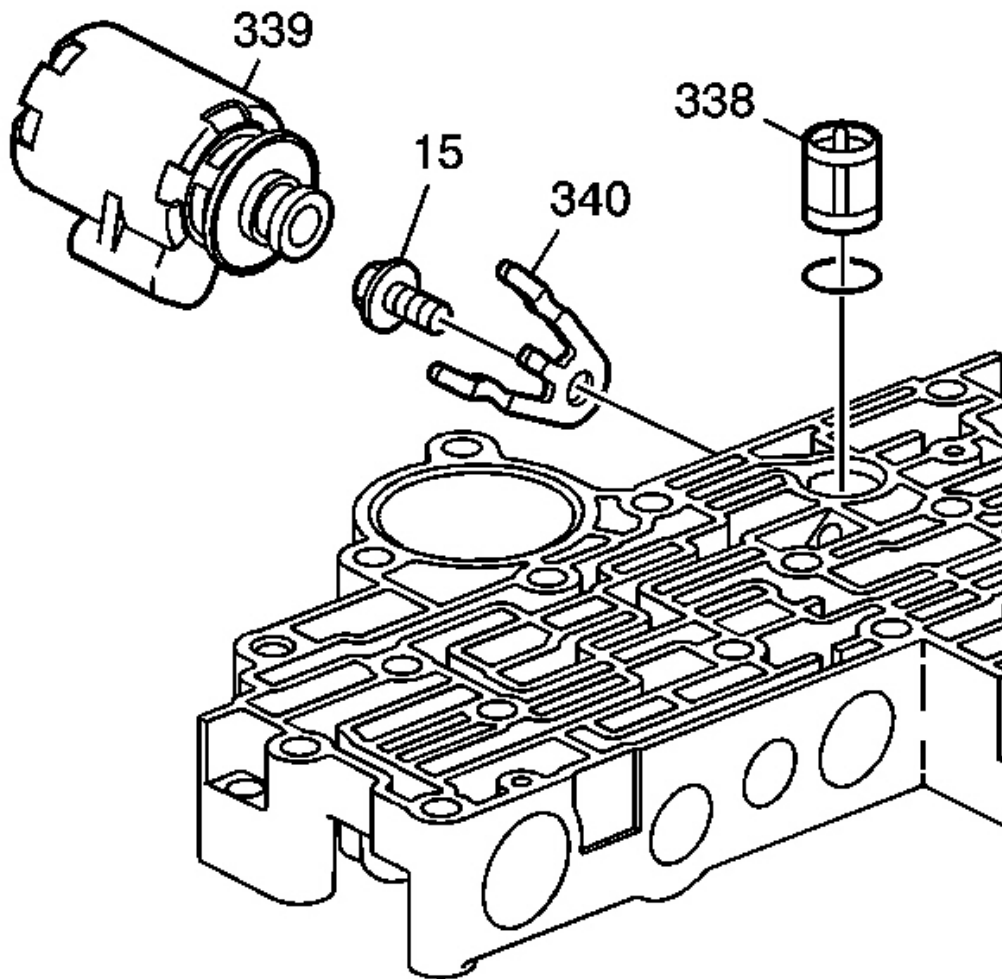


Fig. 213: Locating Pressure Control Solenoid Filter, Valve & Seal
Courtesy of GENERAL MOTORS CORP.

4. Remove the pressure control solenoid clamp bolt (15), the pressure control solenoid clamp (340), and the pressure control solenoid valve (339). Inspect the pressure control solenoid seals for damage.
5. Remove the pressure control solenoid filter and seal (338). Inspect the filter seal for damage.

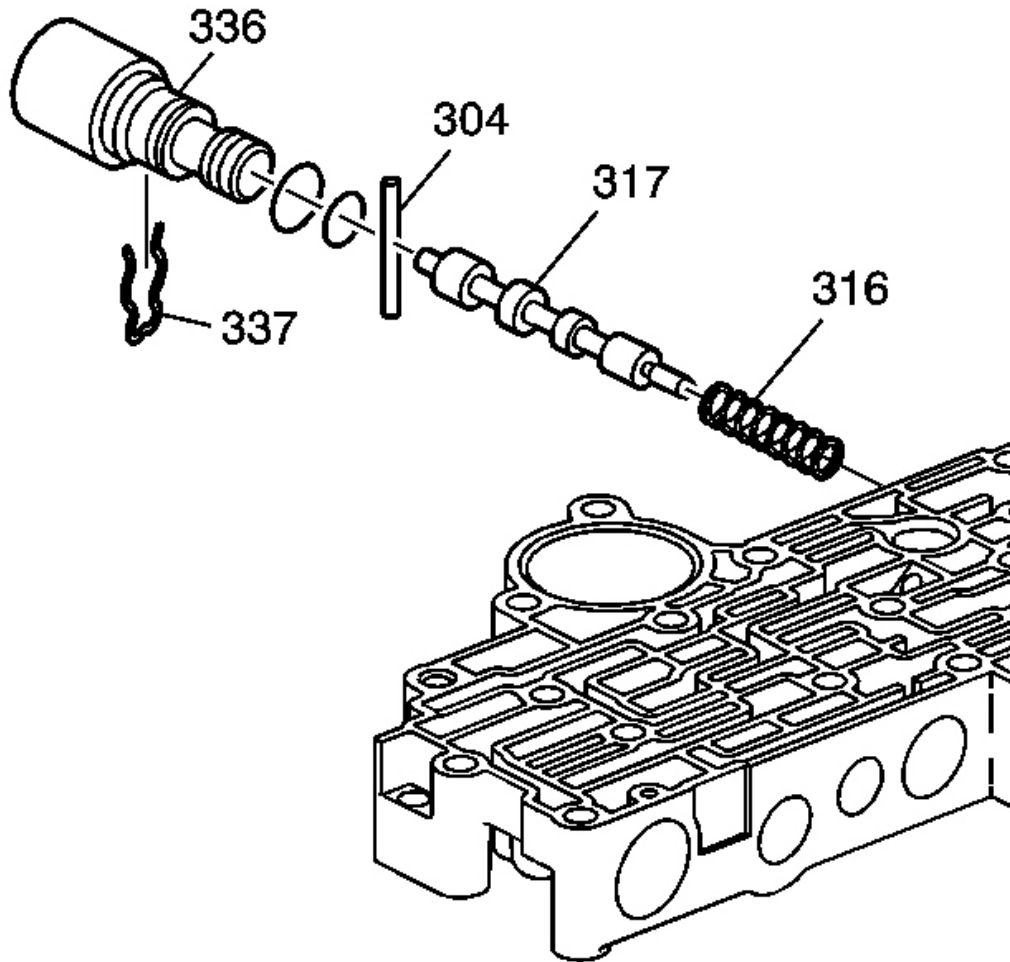


Fig. 214: Torque Converter Clutch Solenoid Valve
Courtesy of GENERAL MOTORS CORP.

6. Remove the spring retainer clip (337), then remove the torque converter clutch solenoid valve (336). Inspect the seals on the torque converter clutch solenoid valve for damage.
7. Remove the coiled spring pin (304), the converter clutch control valve (317), and the converter clutch control valve spring (316). Inspect the valve and bore for nicks, scratches, or wear.

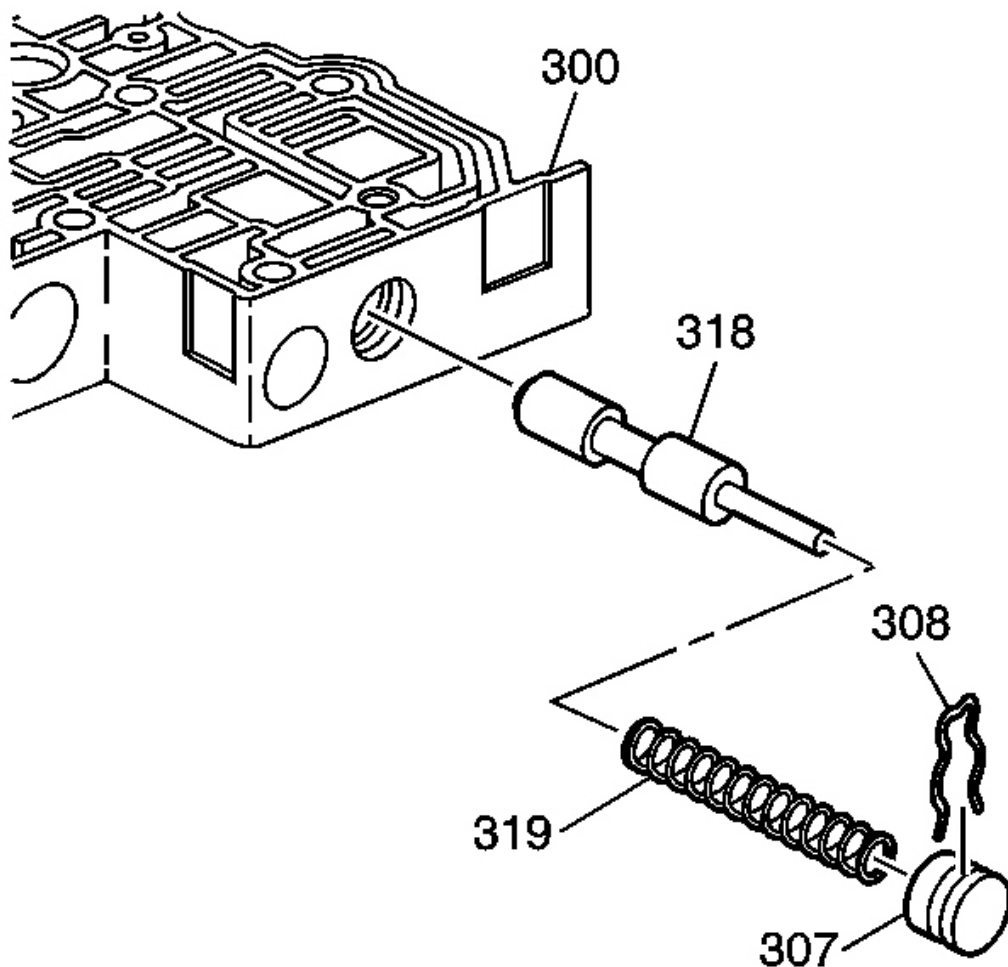


Fig. 215: View Of Converter Regulator Valve
Courtesy of GENERAL MOTORS CORP.

8. Remove the retainer clip (308), the bore plug (307), the converter clutch regulator valve spring (319), and the converter regulator valve (318). Inspect the converter regulator valve and bore for nicks, scratches, or wear.

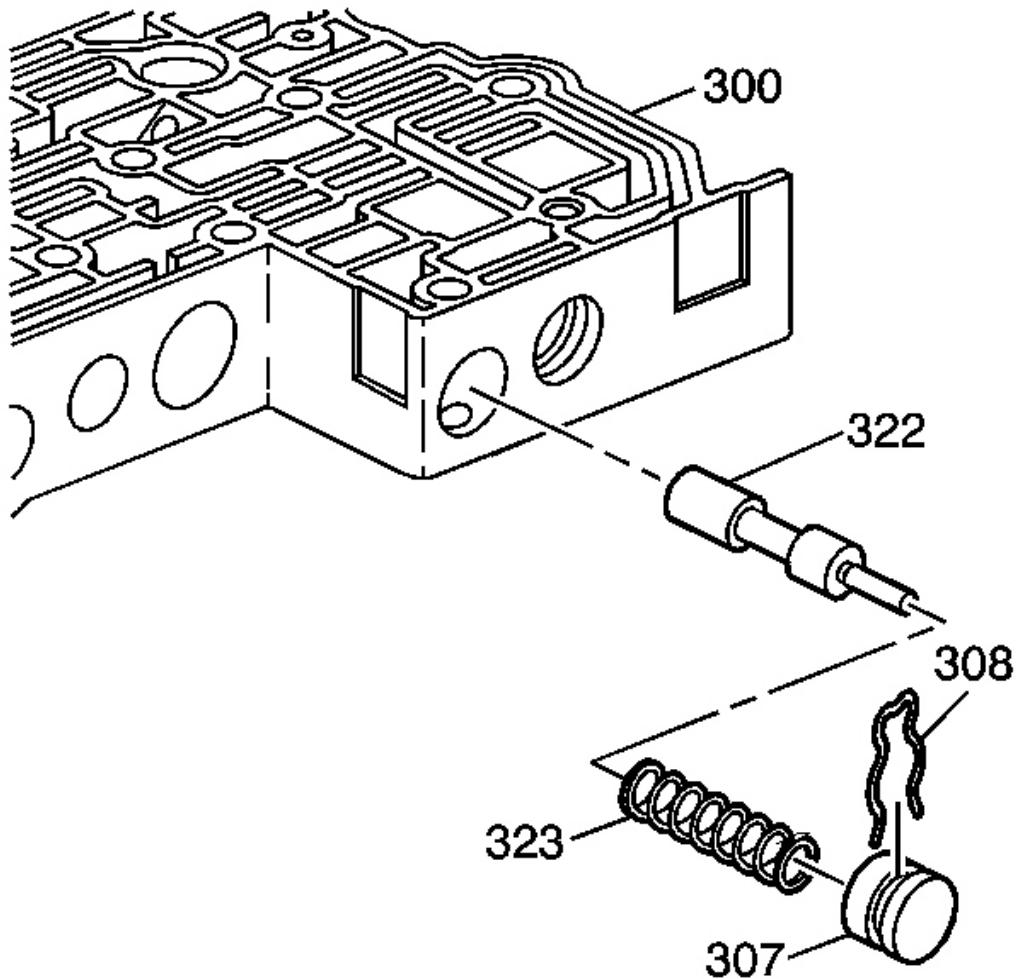


Fig. 216: Locating Torque Converter Clutch Enable Valve
Courtesy of GENERAL MOTORS CORP.

9. Remove the retainer clip (308), the bore plug (307), the torque converter clutch enable spring (323) and the torque converter clutch enable valve (322). Inspect the torque converter clutch enable valve and bore for nicks, scratches, or wear.

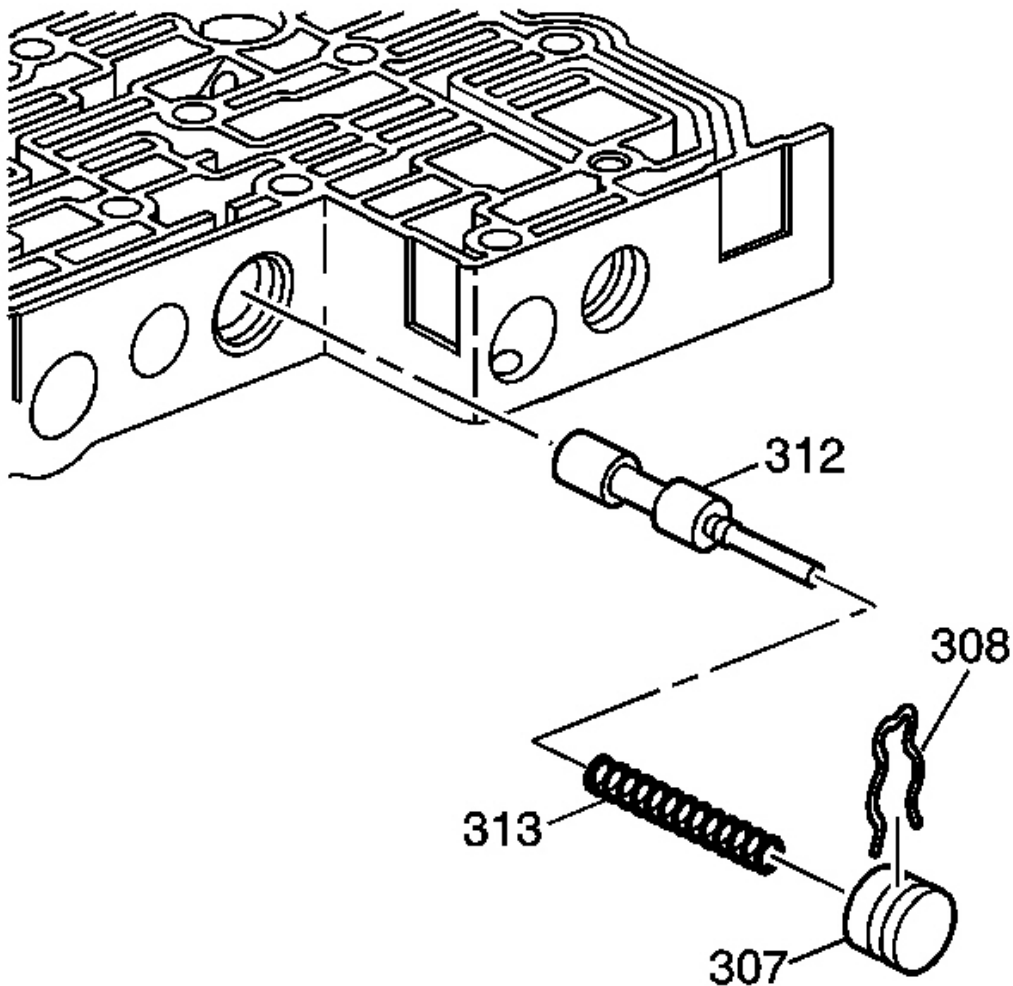


Fig. 217: Identifying Converter Feed Limit Valve
Courtesy of GENERAL MOTORS CORP.

10. Remove the retainer clip (308), the bore plug (307), the converter feed limit spring (313), and the converter feed limit valve (312). Inspect the converter feed limit valve and bore for nicks, scratches, or wear.

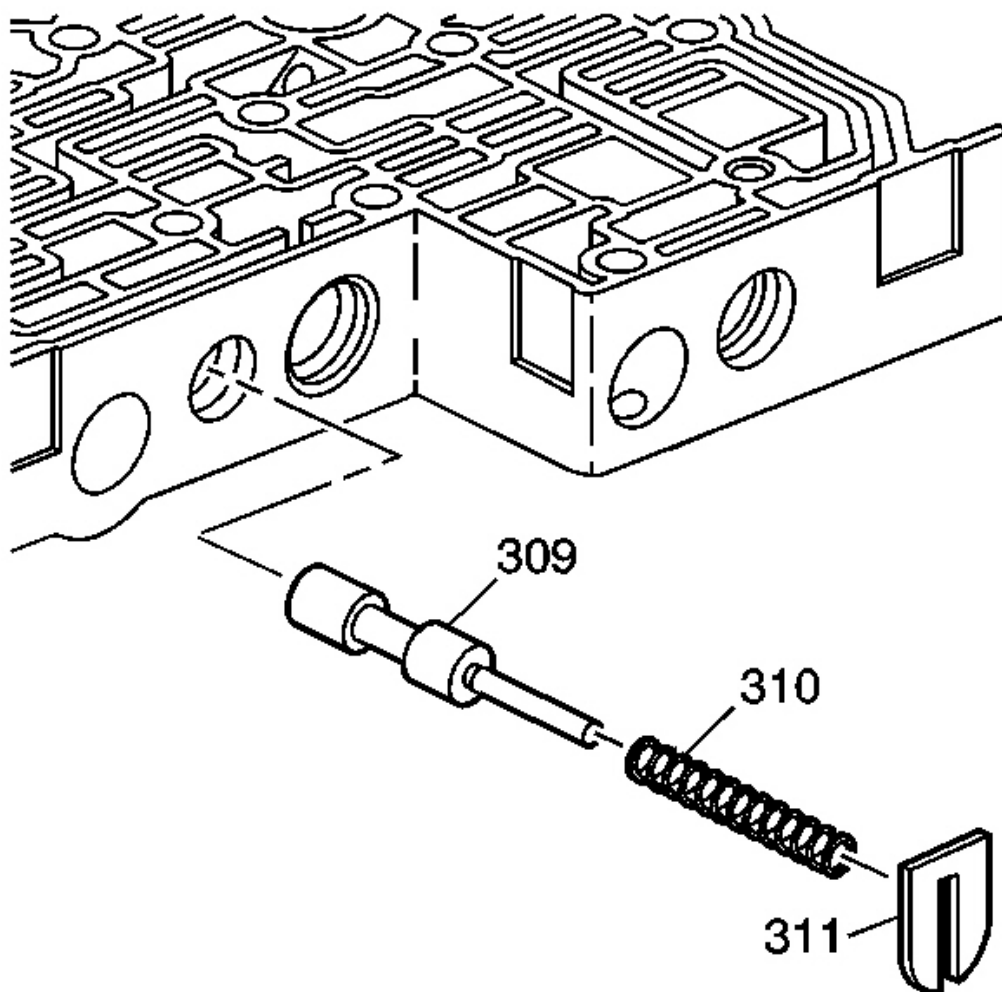


Fig. 218: View Of Actuator Feed Limit Valve
Courtesy of GENERAL MOTORS CORP.

11. Remove the spring retainer plate (311), the actuator feed limit spring (310), and the actuator feed limit valve (309). Inspect the feed limit valve and bore for nicks, scratches, or wear.

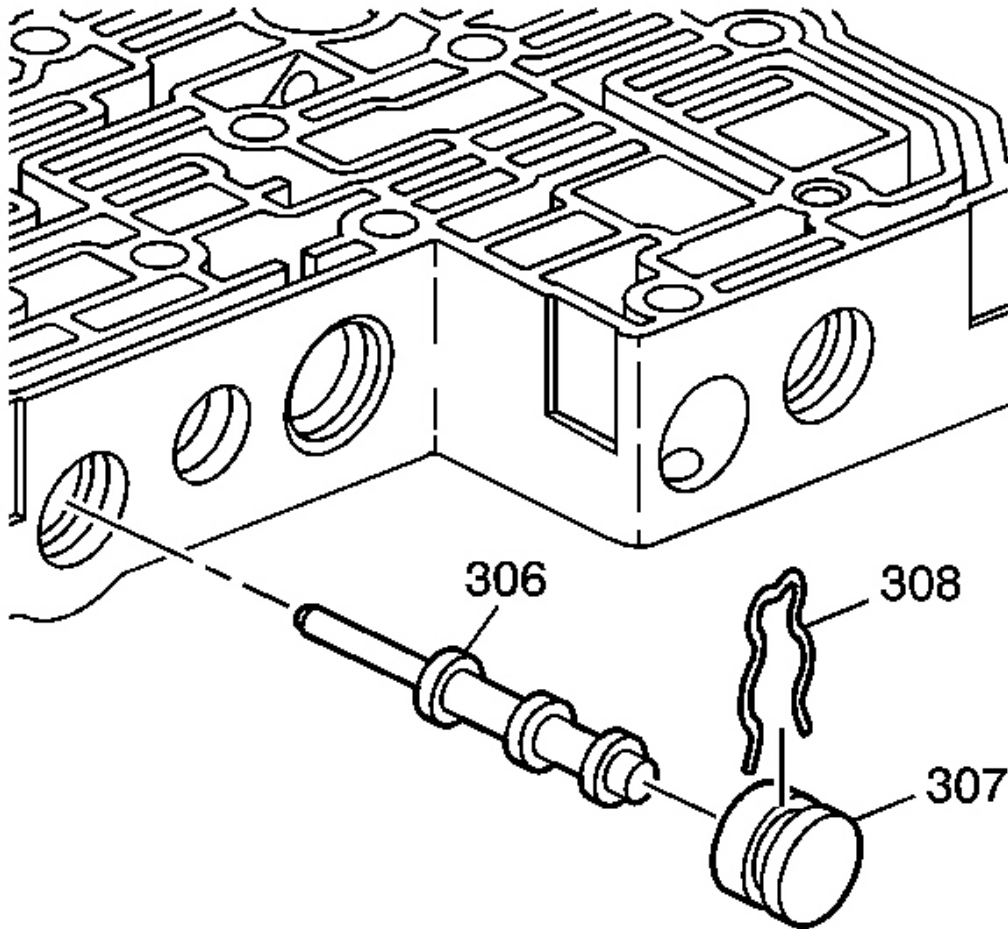


Fig. 219: Locating 2-3 Accumulator Valve
Courtesy of GENERAL MOTORS CORP.

12. Remove the retainer clip (308), the bore plug (307), and the 2-3 accumulator valve (306). Inspect the 2-3 accumulator valve and bore for nicks, scratches, or wear.

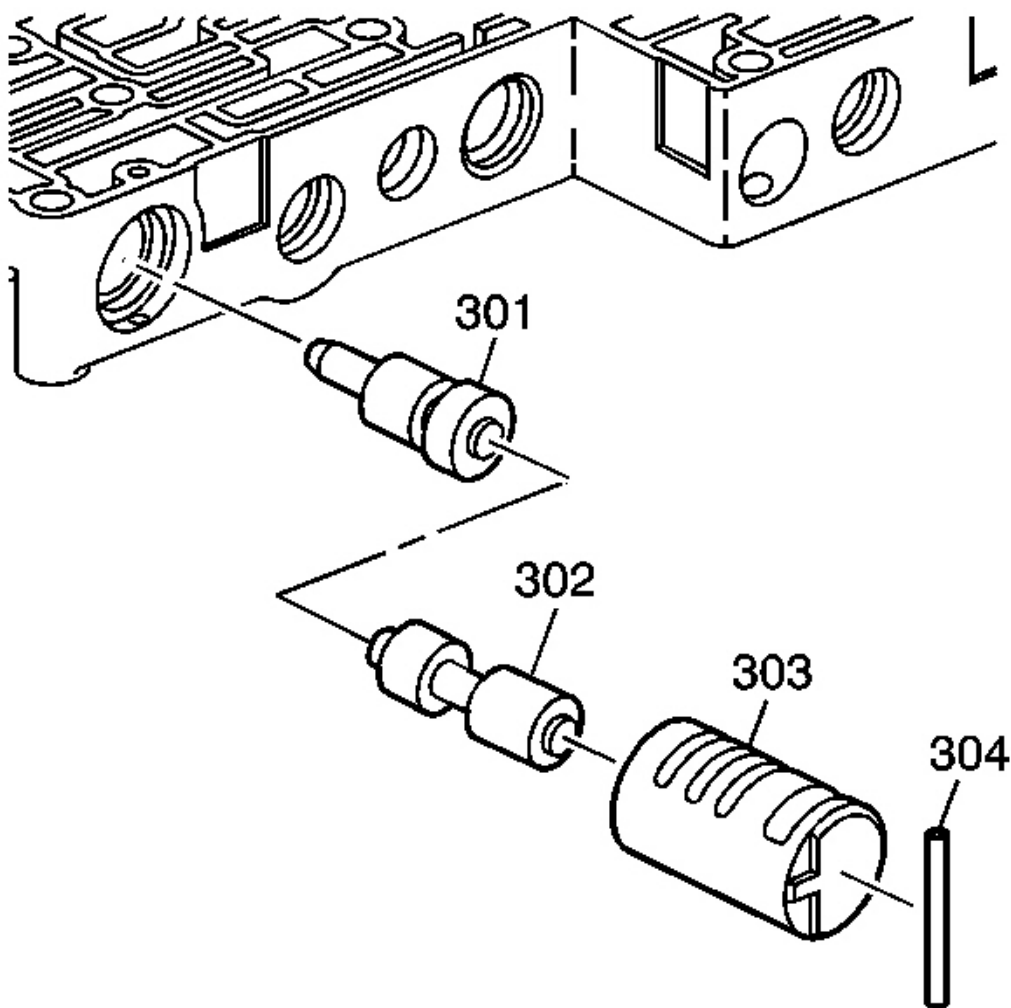


Fig. 220: Identifying 1-2, 3-4 Accumulator Valves
Courtesy of GENERAL MOTORS CORP.

13. Remove the coiled spring pin (304), the 1-2, 3-4 accumulator bushing (303), and the accumulator valves (301, 302). Inspect the valves for nicks, scratches, or wear.

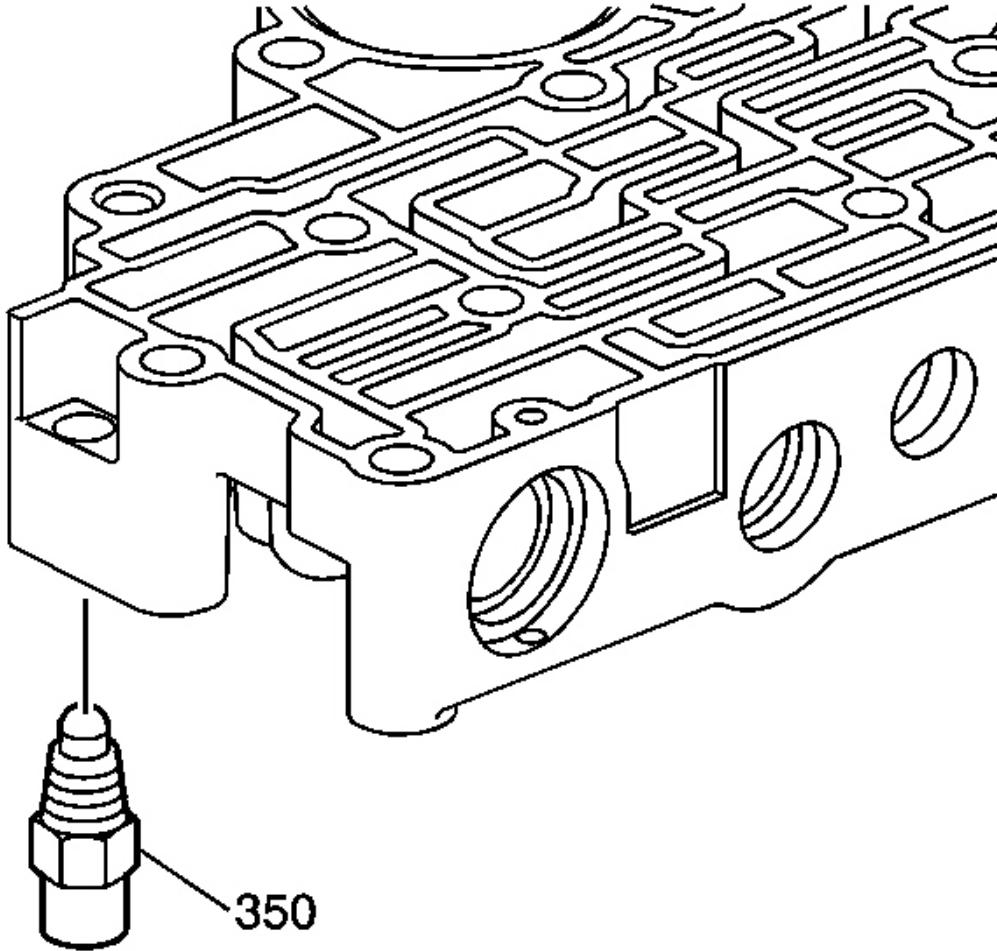


Fig. 221: View Of Automatic Transmission Fluid Temperature Sensor
Courtesy of GENERAL MOTORS CORP.

14. Remove the automatic transmission fluid temperature sensor (350).

UPPER CONTROL VALVE BODY ASSEMBLE

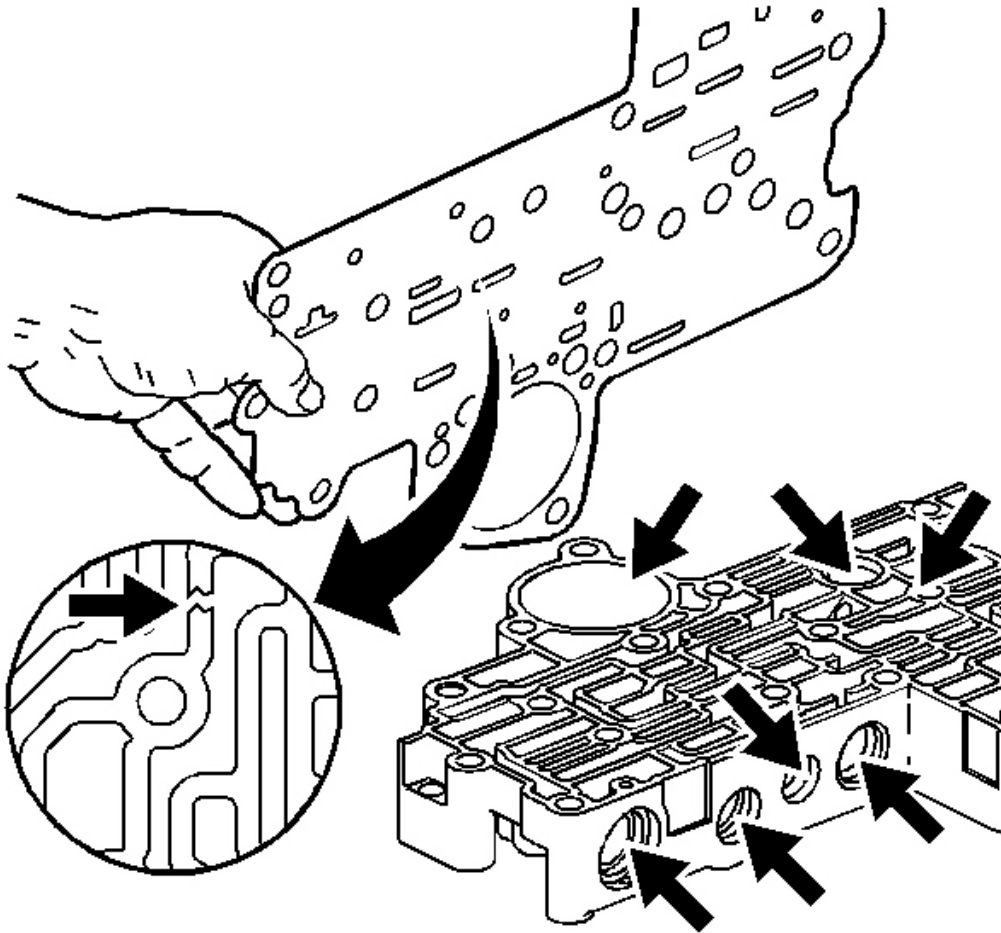


Fig. 222: Identifying Upper Control Valve Body Gasket Damage
Courtesy of GENERAL MOTORS CORP.

1. Inspect all valve body passages for debris, and then inspect the gasket for damage.

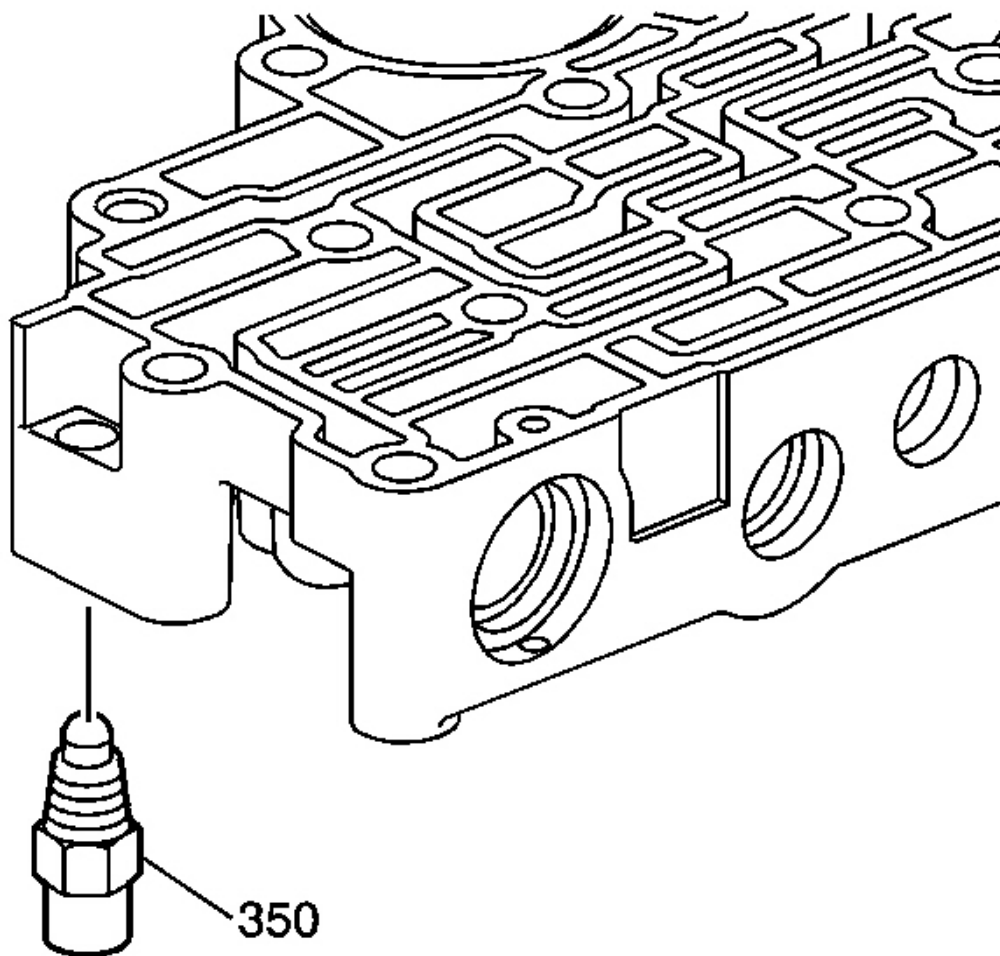


Fig. 223: View Of Automatic Transmission Fluid Temperature Sensor
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to **FASTENER NOTICE** in Cautions and Notices.

2. Install the automatic transmission fluid temperature sensor (350).

Tighten: Tighten the automatic transmission fluid temperature sensor to 3.4 N.m (30 lb in).

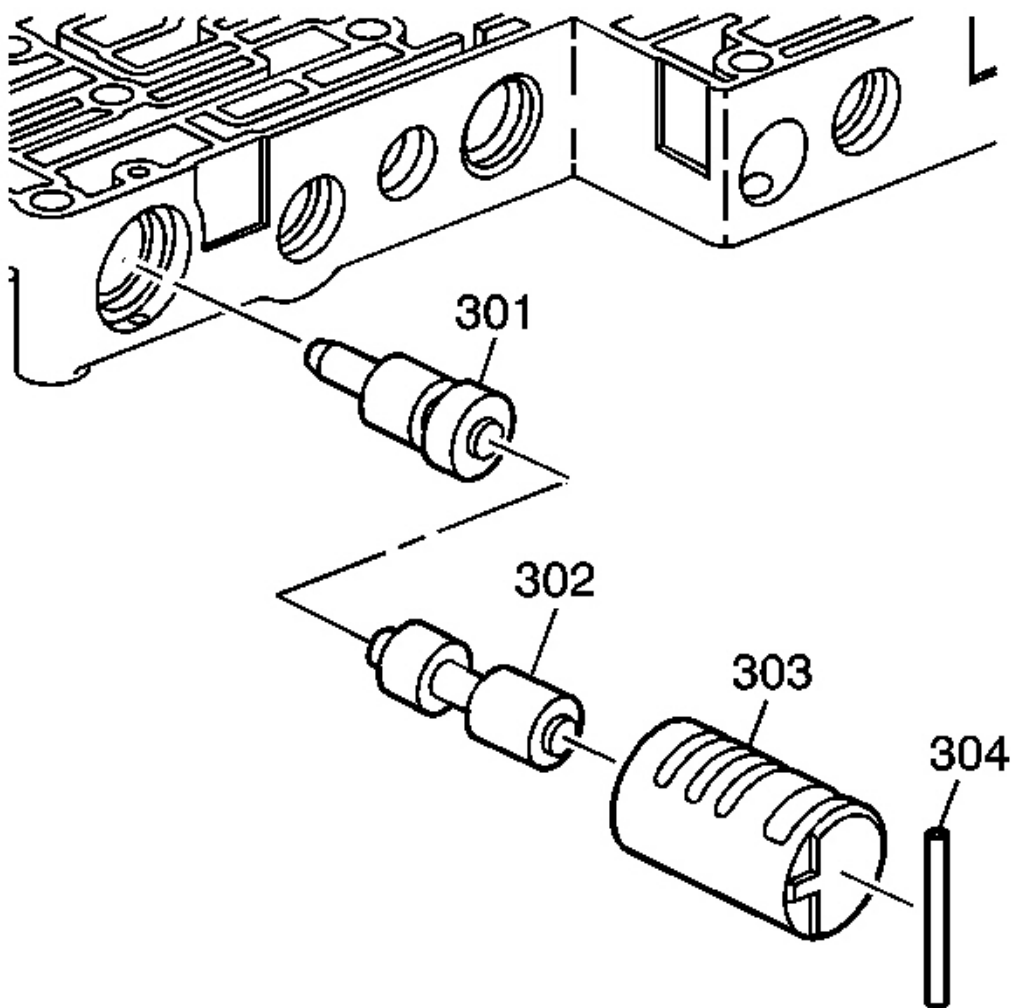


Fig. 224: Identifying 1-2, 3-4 Accumulator Valves
Courtesy of GENERAL MOTORS CORP.

3. Install the following parts:
 - The 1-2, 3-4 accumulator valves (301, 302)
 - The bushing (303)
 - The coiled spring pin (304)

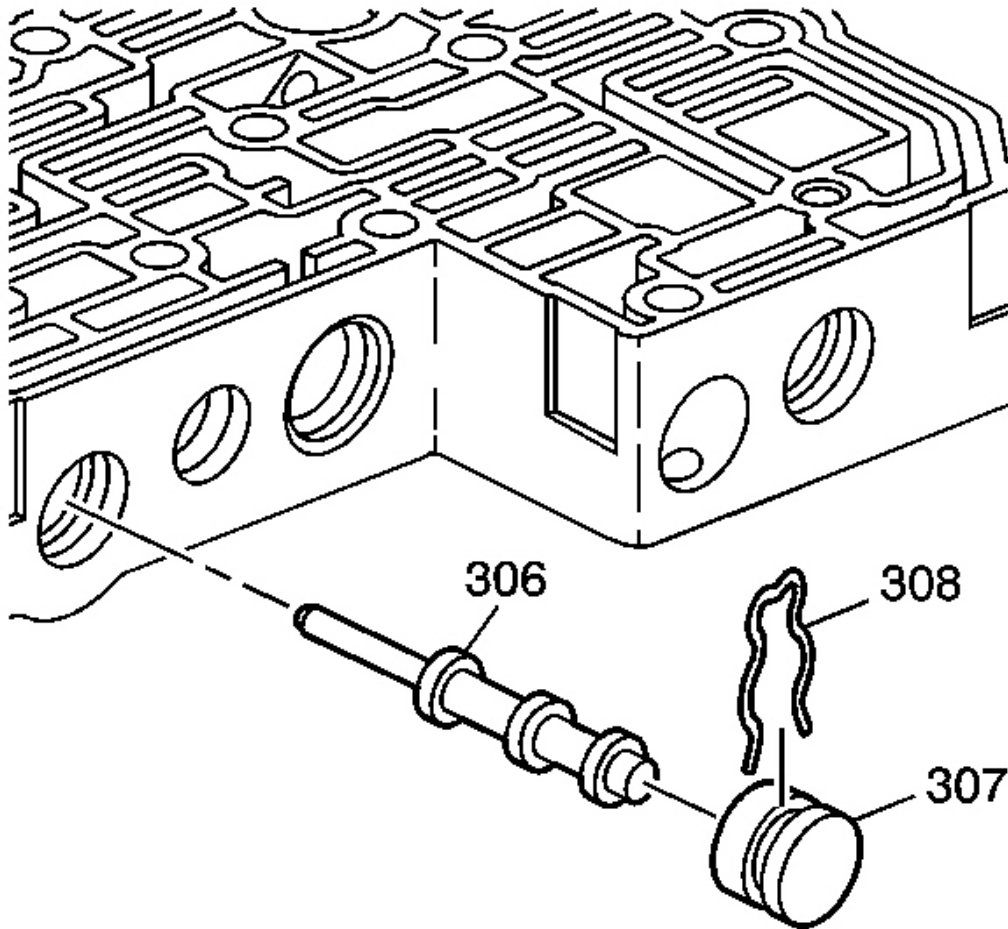


Fig. 225: Locating 2-3 Accumulator Valve
Courtesy of GENERAL MOTORS CORP.

4. Install the following parts:
 - The 2-3 accumulator valve (306)
 - The bore plug (307)
 - The retainer clip (308)

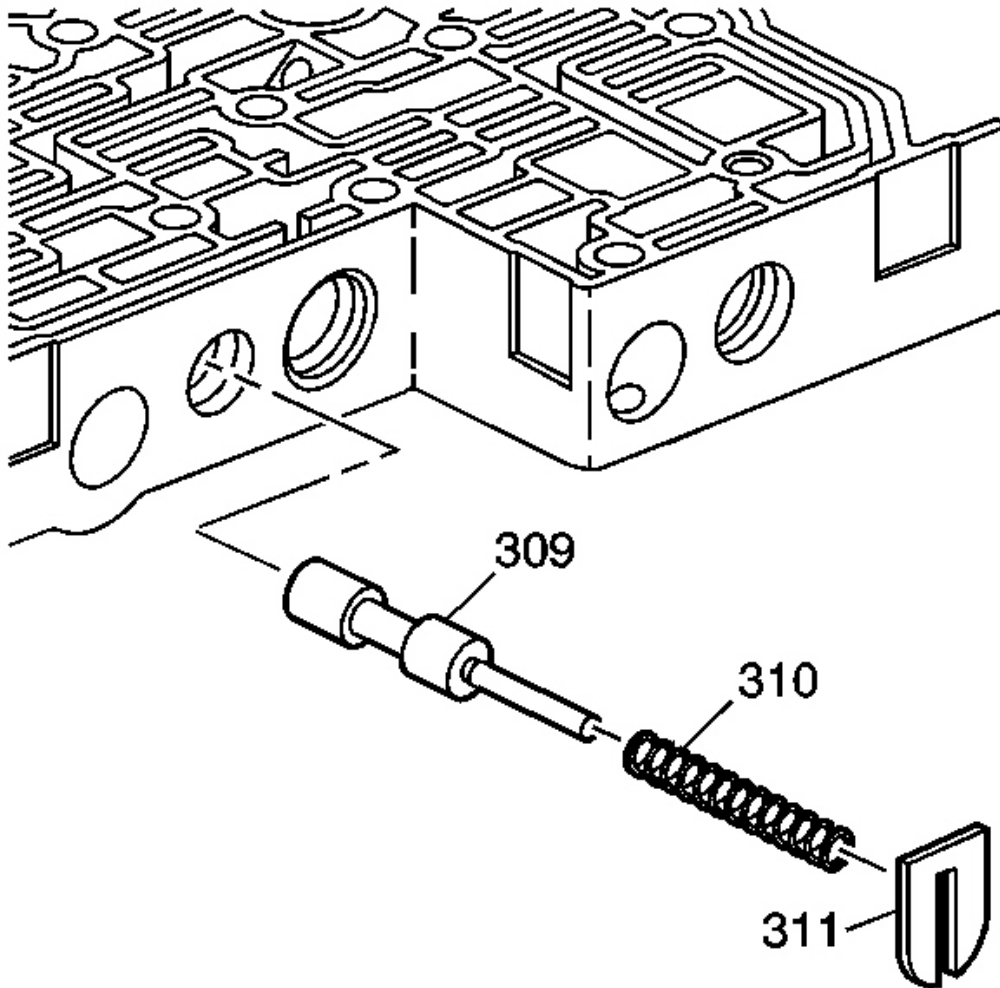


Fig. 226: View Of Actuator Feed Limit Valve
Courtesy of GENERAL MOTORS CORP.

5. Install the following parts:
 - The actuator feed limit valve (309)
 - The actuator feed limit valve spring (310)
 - The spring retaining plate (311)

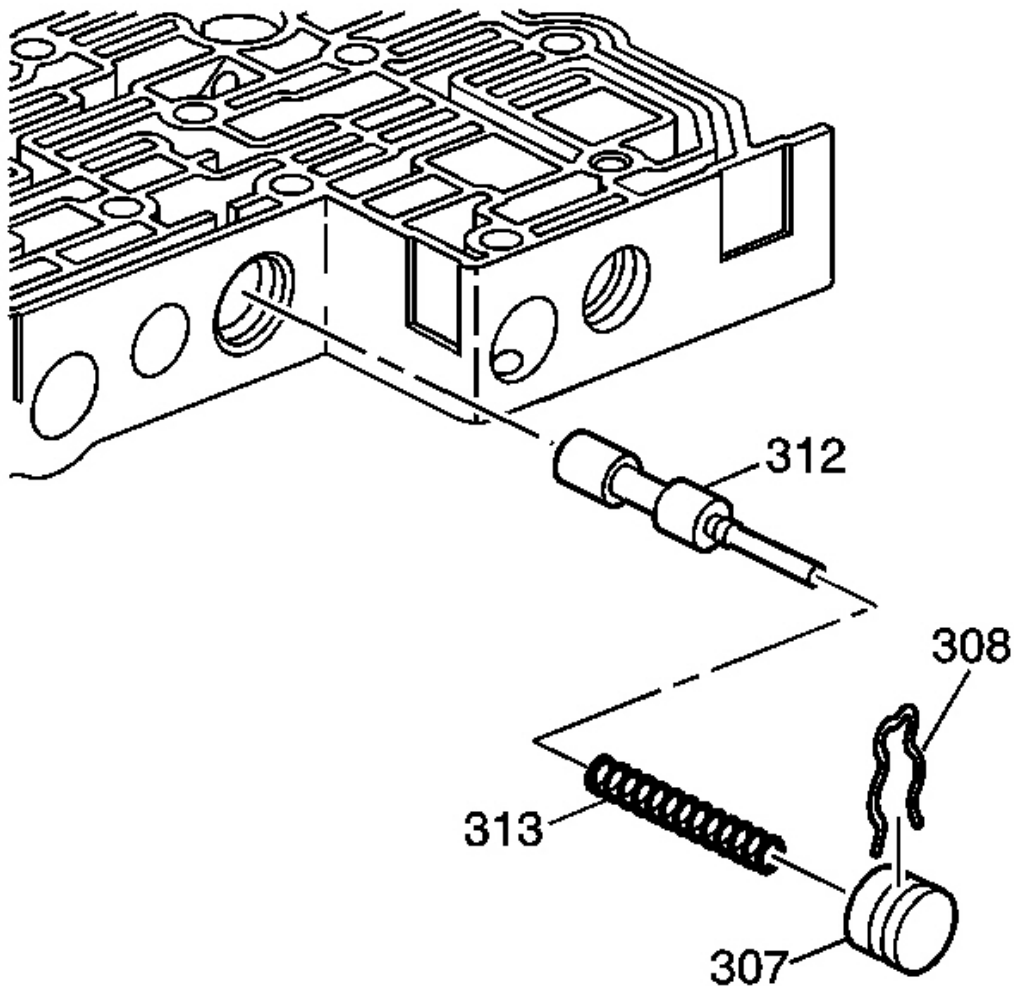


Fig. 227: Identifying Converter Feed Limit Valve
Courtesy of GENERAL MOTORS CORP.

6. Install the following parts:
- The converter feed limit valve (312)
 - The converter feed limit valve spring (313)
 - The bore plug (307)
 - The retaining clip (308)

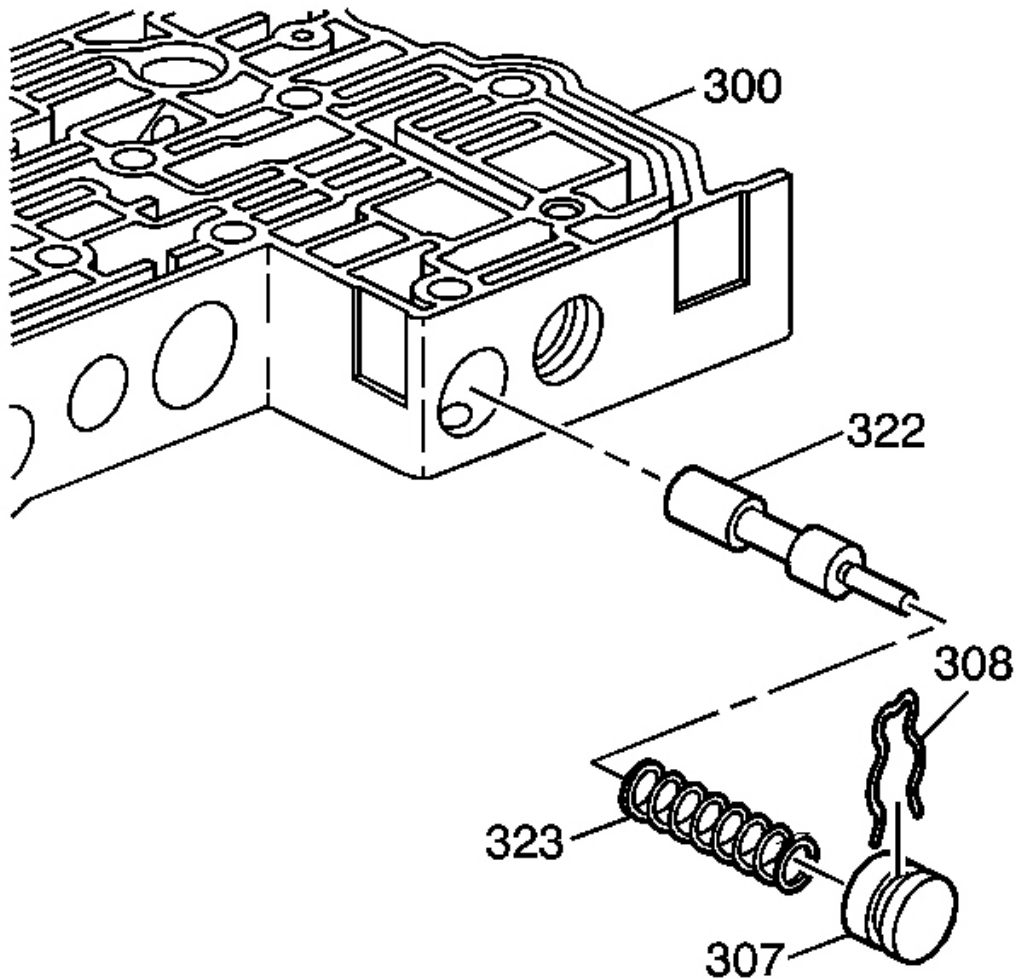


Fig. 228: Locating Torque Converter Clutch Enable Valve
Courtesy of GENERAL MOTORS CORP.

7. Install the following parts:

- The torque converter clutch enable valve (322)
- The torque converter clutch enable valve spring (323)
- The bore plug (307)
- The retainer clip (308)

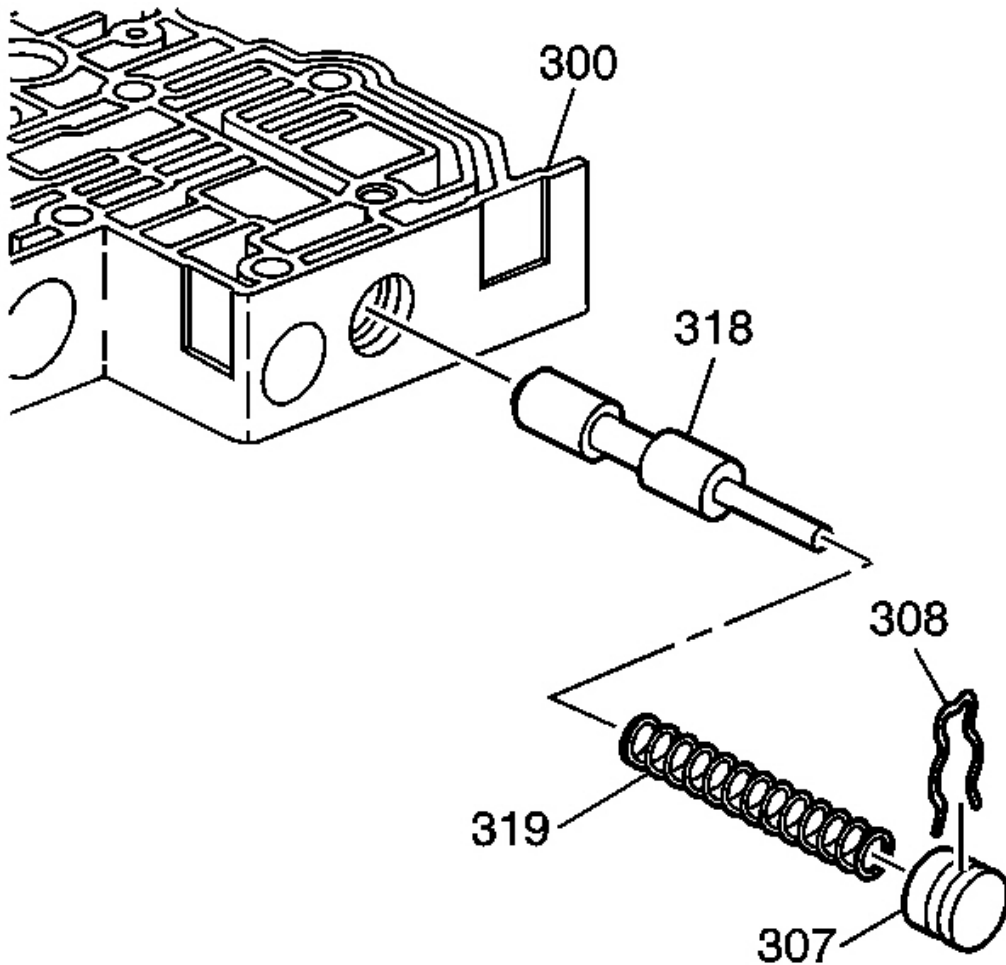


Fig. 229: View Of Converter Regulator Valve
Courtesy of GENERAL MOTORS CORP.

8. Install the following parts:
- The converter regulator valve (318)
 - The converter regulator valve spring (319)
 - The bore plug (307)
 - The retainer clip (308)

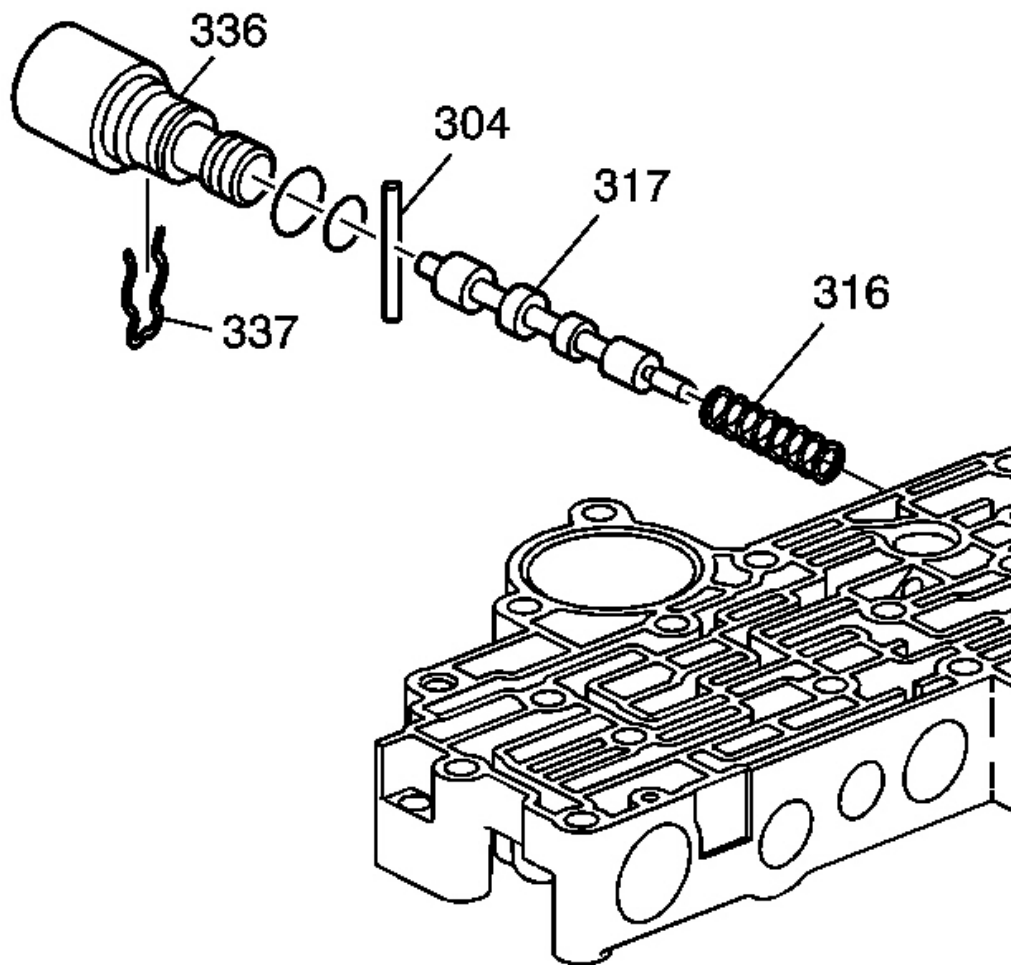


Fig. 230: Torque Converter Clutch Solenoid Valve
Courtesy of GENERAL MOTORS CORP.

9. Install the following parts:

- The converter clutch control spring (316)
- The converter clutch control valve (317)
- The coiled spring pin (304)
- The torque converter clutch solenoid valve (336)
- The spring retainer clip from the torque converter clutch solenoid valve (337)

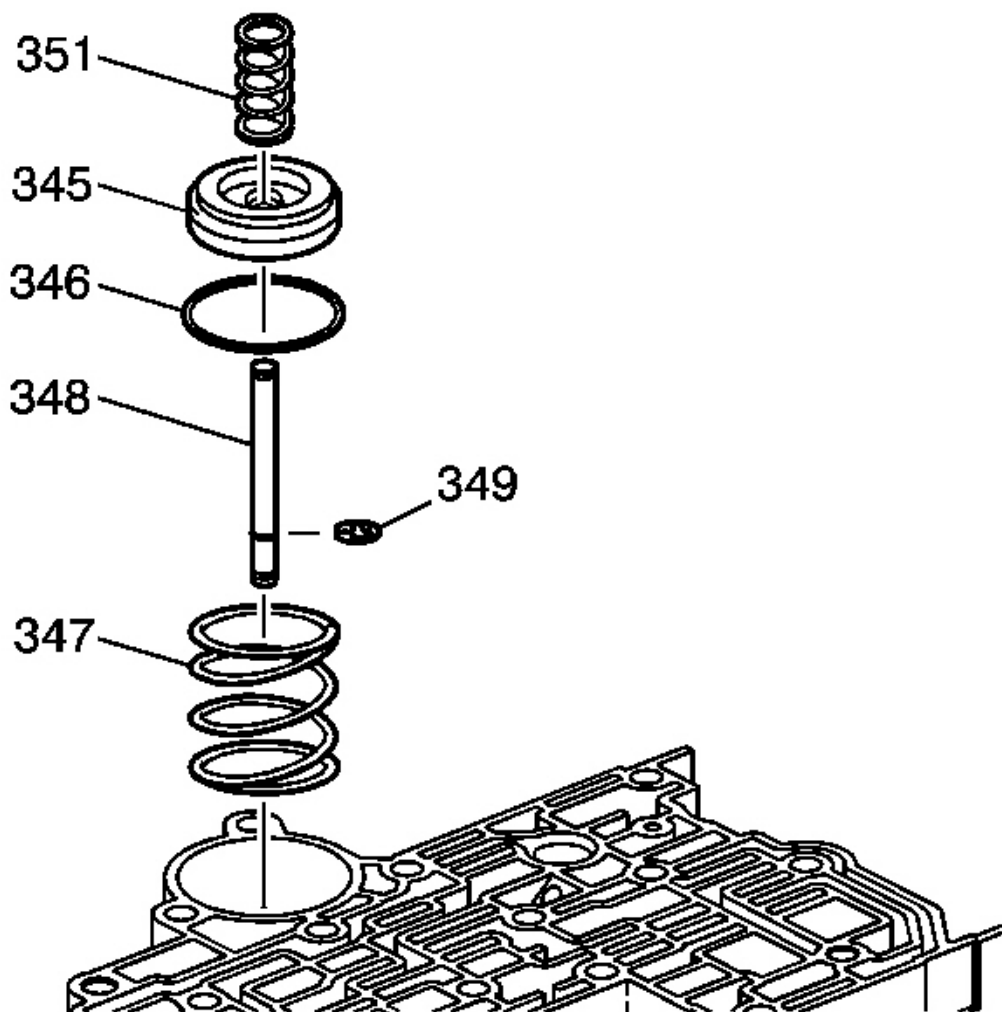


Fig. 232: Identifying 2-3 Accumulator Piston Components
Courtesy of GENERAL MOTORS CORP.

12. Install the following parts:

- The 2-3 accumulator pin (348)
- The snap ring (349)
- The 2-3 accumulator piston spring (347)
- The accumulator piston and seal (345, 346)
- The 2-3 piston cushion spring (351)

UPPER CONTROL VALVE ASSEMBLY INSTALLATION

Tools Required

J 39068 Pump Assembly Guide Pins

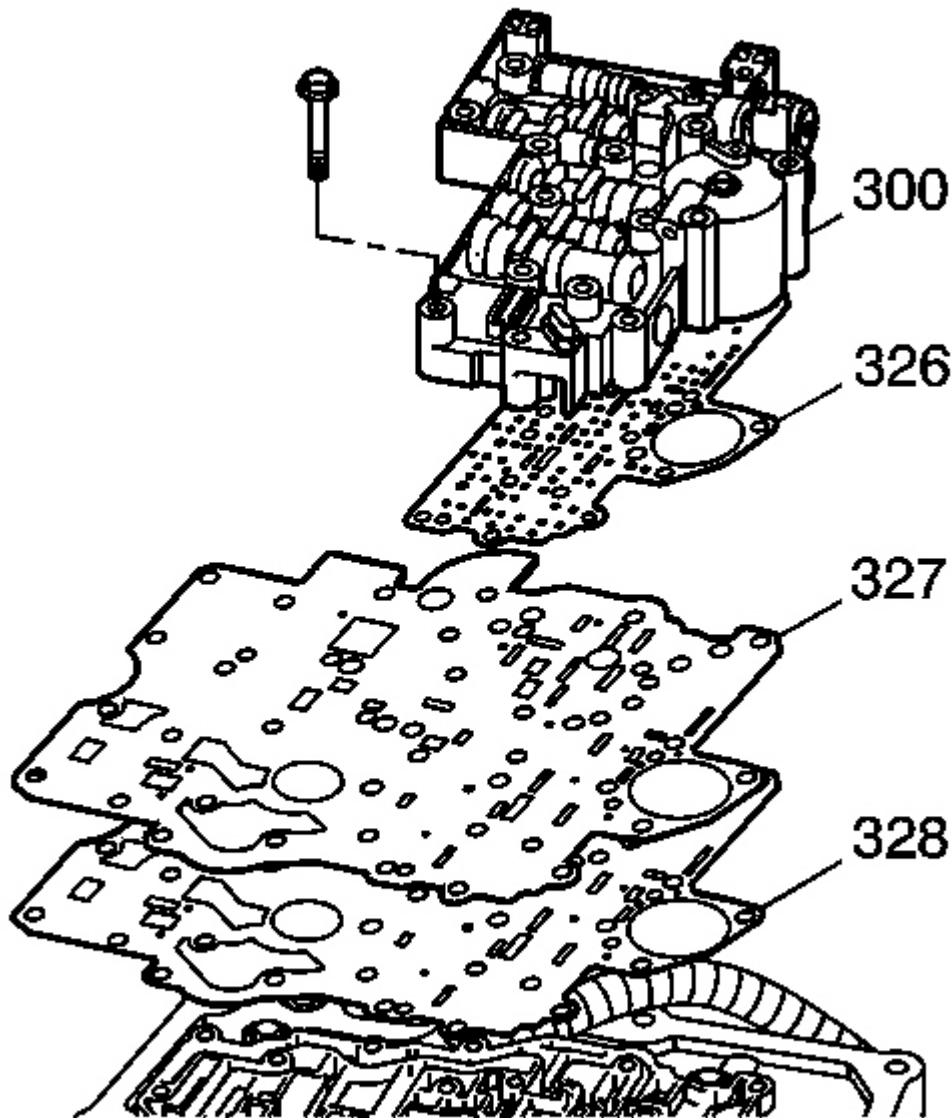


Fig. 233: View Of Upper Control Valve Assembly Components

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Courtesy of GENERAL MOTORS CORP.

1. Install the **J 39068** for the upper valve body. Install the following parts:
 - The spacer plate to case cover gasket (328)
 - The case cover spacer plate (327)
 - The valve body to spacer plate gasket (326)
 - The upper control valve body (300)

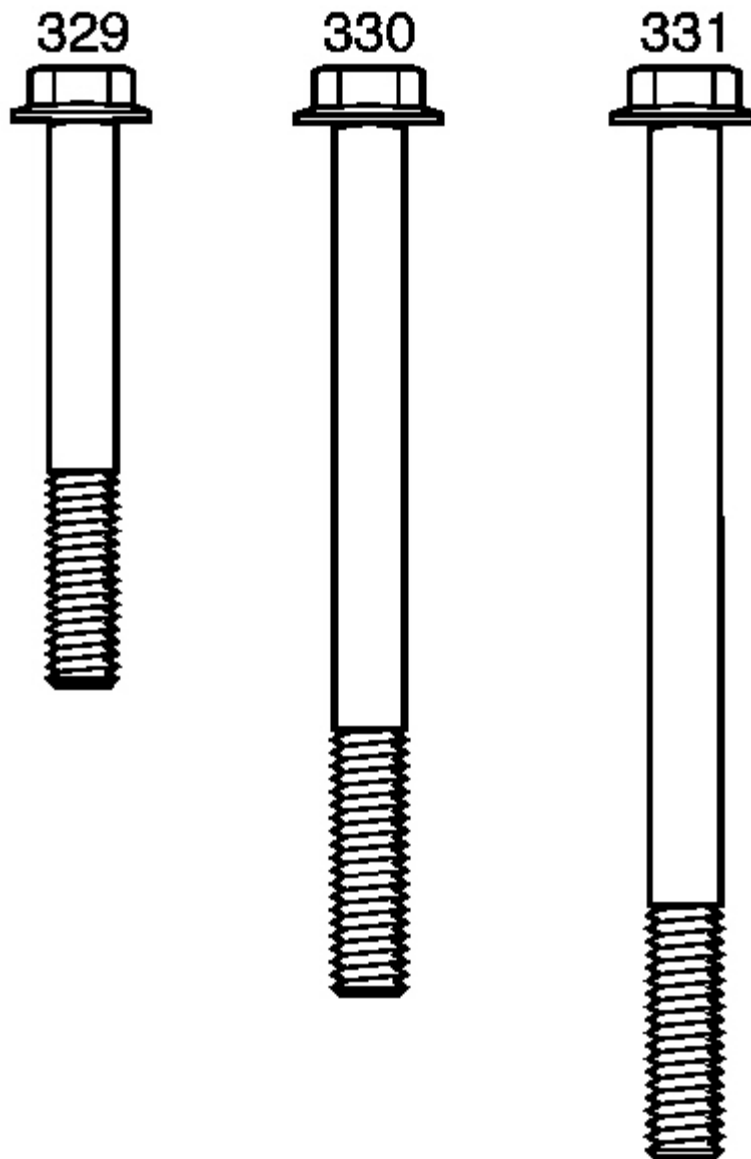


Fig. 234: Identifying Upper Control Valve Body Bolts
Courtesy of GENERAL MOTORS CORP.

2. Apply pipe thread sealant, GM P/N 12346004 to upper control valve body bolt threads.
3. Install the upper control valve body bolts (229, 329, 330, 331) and hand tighten.

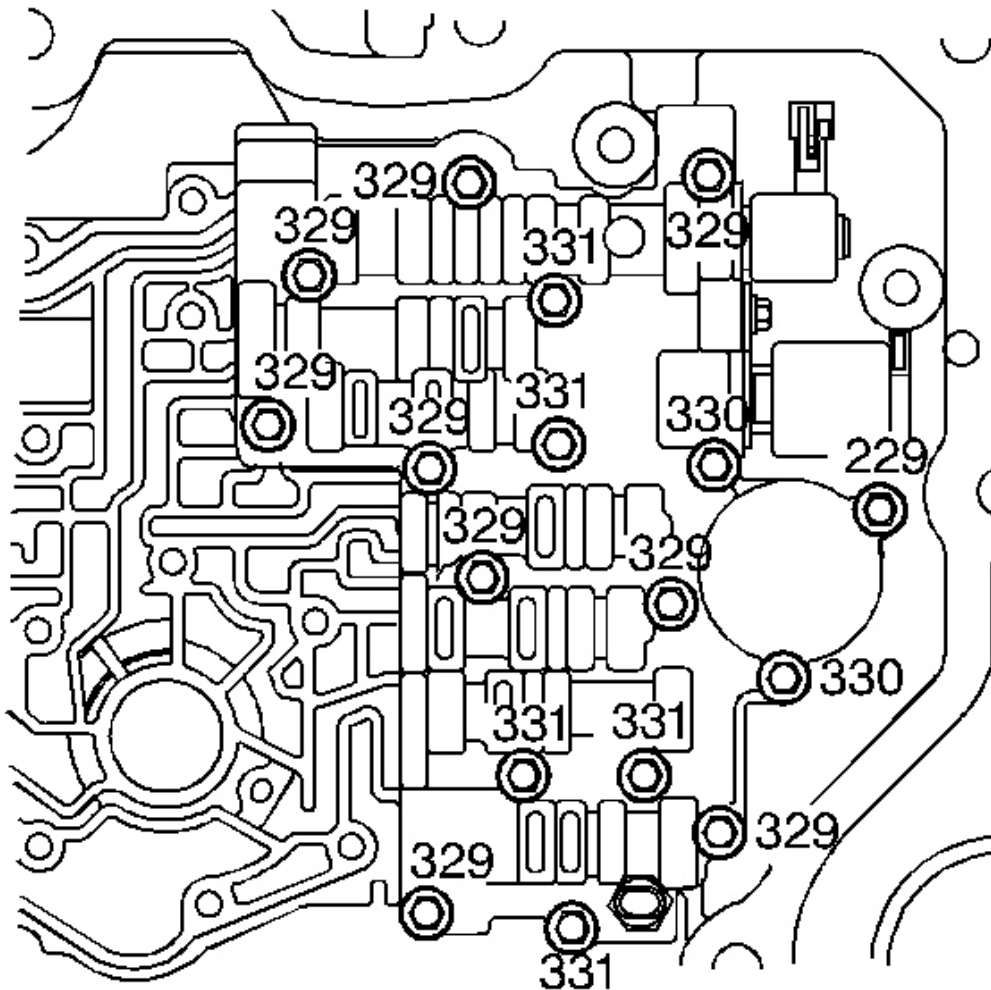


Fig. 235: Installing Upper Control Valve Body Bolts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to **FASTENER NOTICE** in Cautions and Notices.

4. Remove the guide pins and install the remaining bolt.

Tighten: Tighten the bolts to 11-13 N.m (8.0-9.5 lb ft).

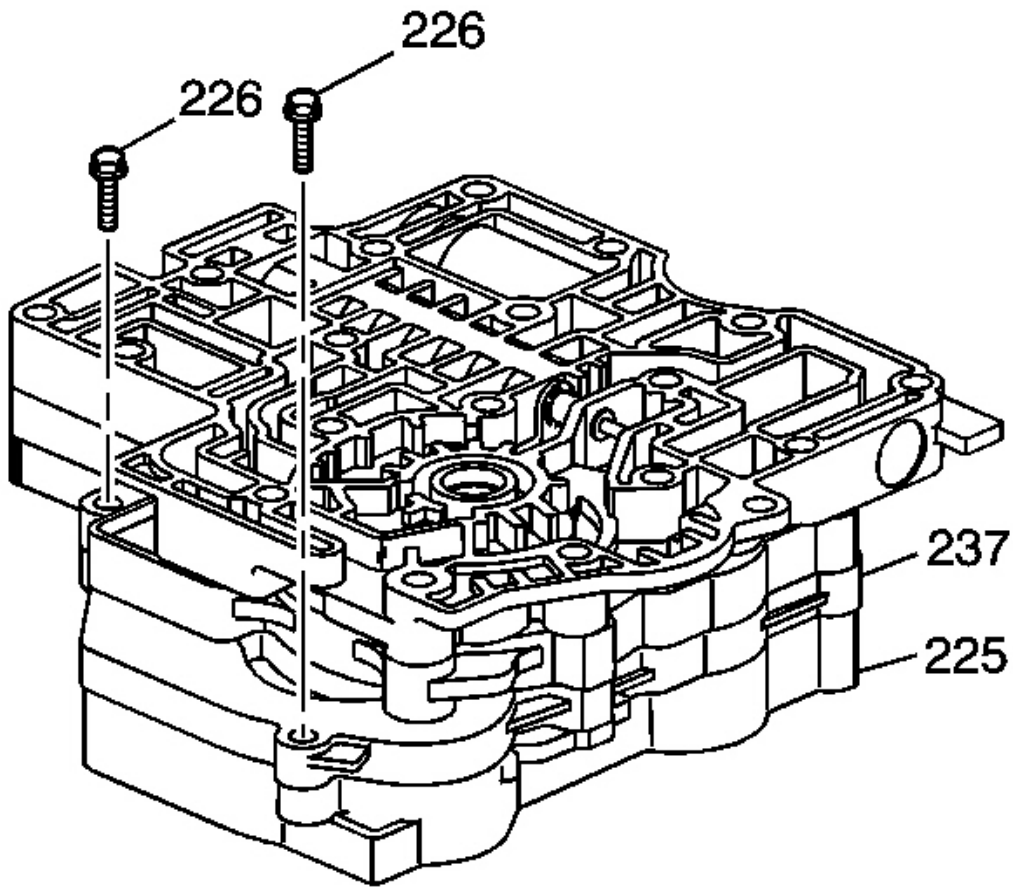


Fig. 236: Locating Scavenge Pump Cover Retaining Bolts
Courtesy of GENERAL MOTORS CORP.

1. Remove the two 10-mm bolts (226) from under the scavenge pump cover (237) and scavenge pump body (225).

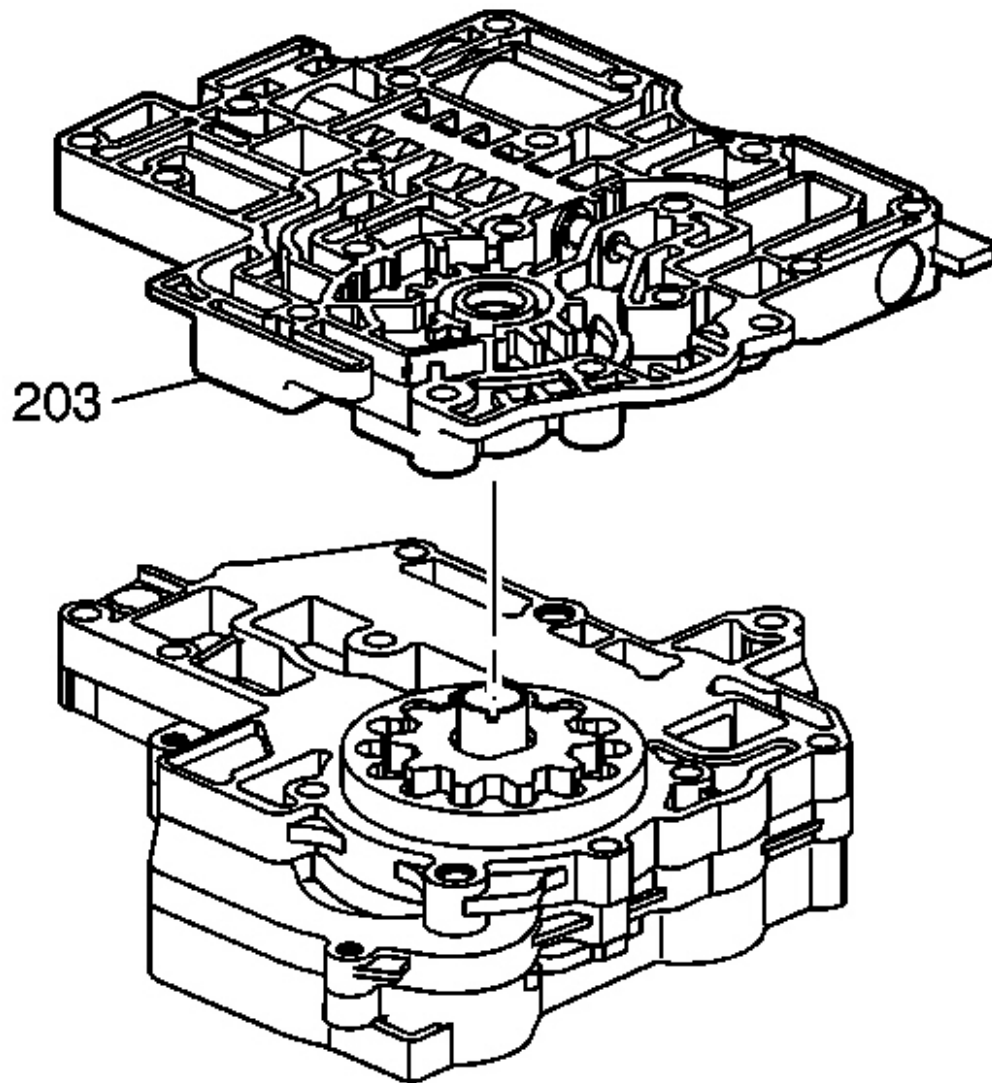


Fig. 237: Removing Secondary Pump Body
Courtesy of GENERAL MOTORS CORP.

2. Remove the secondary pump body (203) from the pump assembly. This is a snug fit due to the use of two dowel pins.

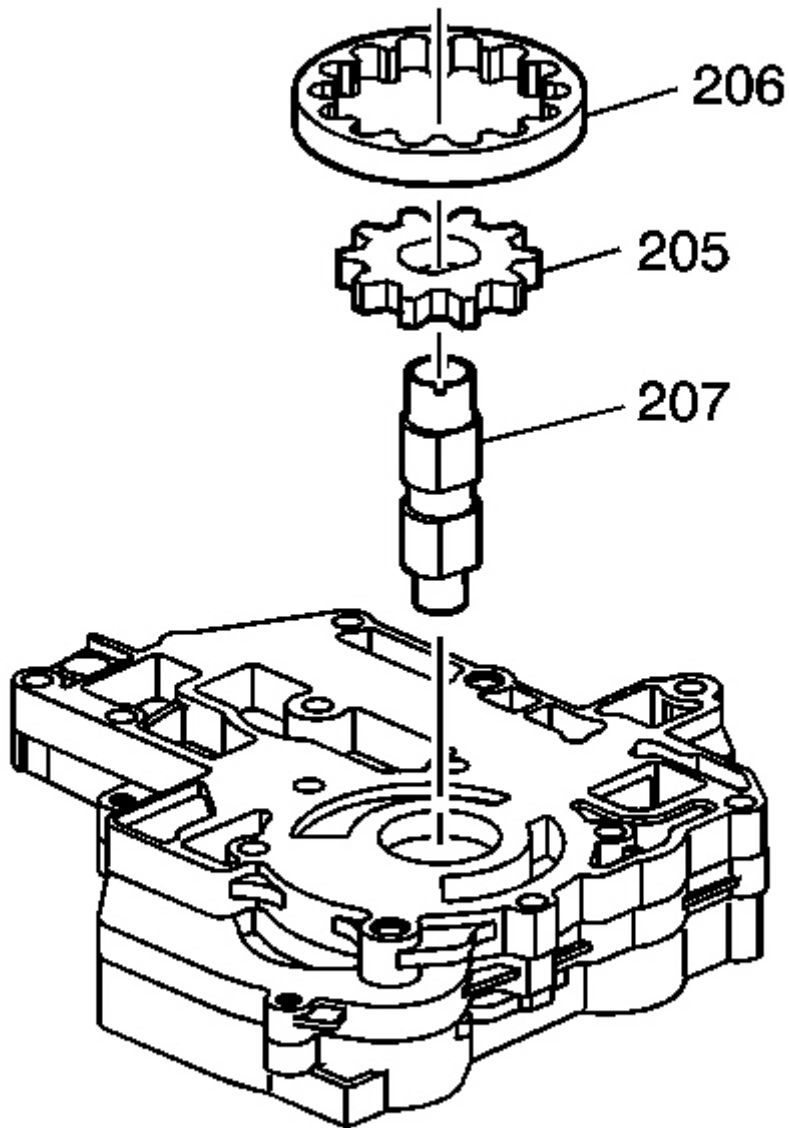


Fig. 238: View Of Oil Pump Drive Shaft & Secondary Pump Gears
Courtesy of GENERAL MOTORS CORP.

3. Remove the oil pump drive shaft (207), and the secondary pump gears (205, 206).

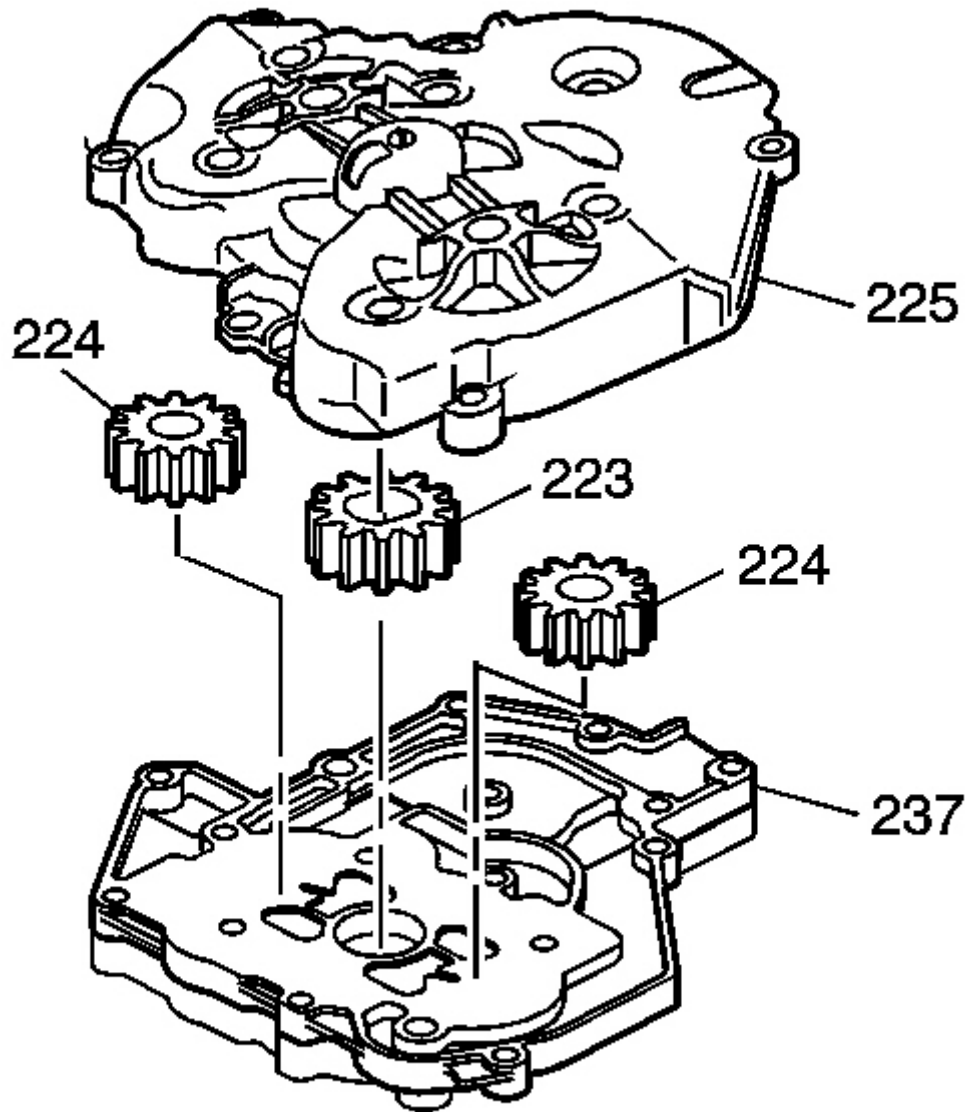


Fig. 239: Identifying Scavenge Pump Gears
Courtesy of GENERAL MOTORS CORP.

4. Remove the scavenge pump body (225) from the scavenge pump cover (237).
5. Remove the scavenge pump gears (223, 224).

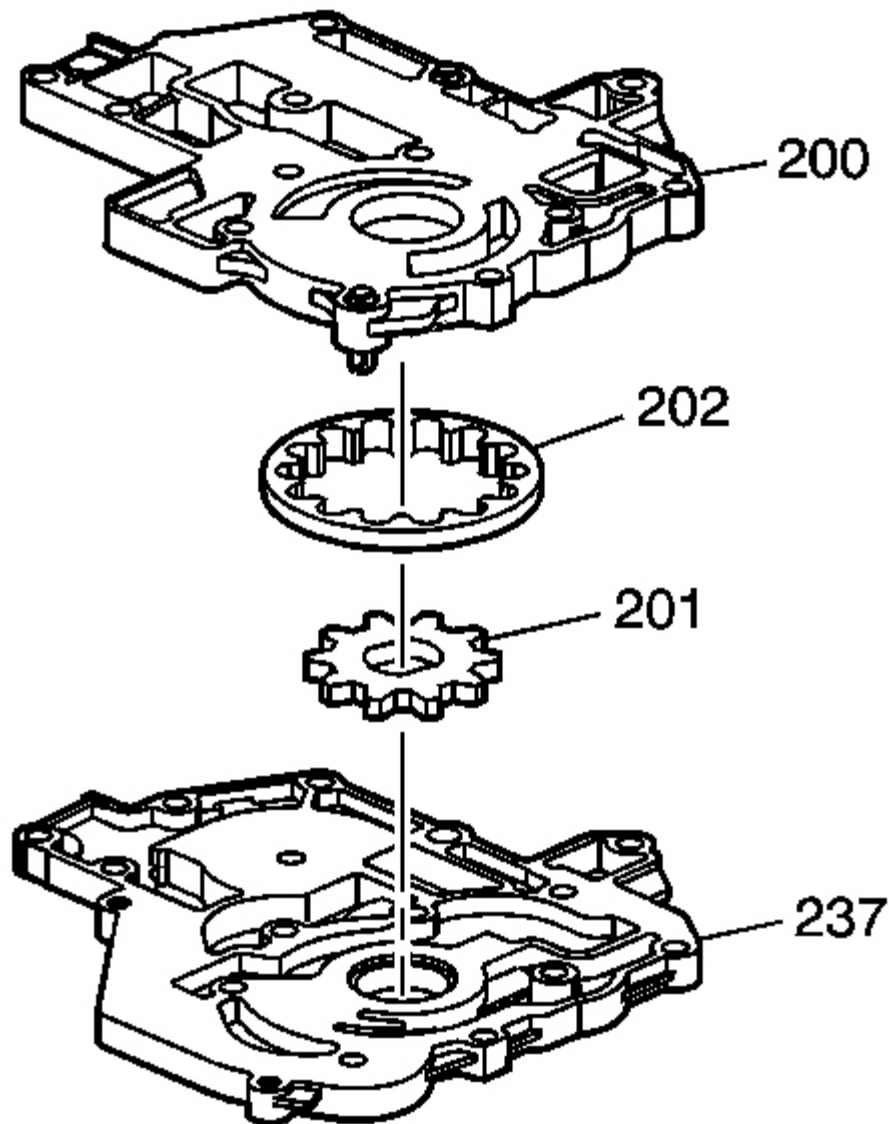


Fig. 240: Removing Primary Pump Gears
Courtesy of GENERAL MOTORS CORP.

6. Remove the primary pump body (200) from the scavenge pump cover (237).
7. Remove the primary pump gears (201, 202).

SECONDARY PUMP DISASSEMBLE

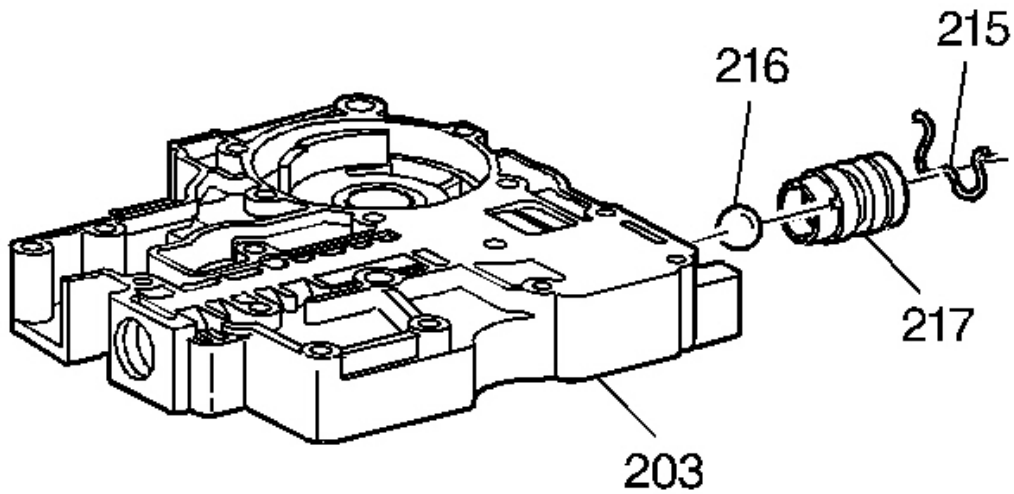


Fig. 241: Locating Pump Secondary Ball Seat
Courtesy of GENERAL MOTORS CORP.

1. Remove the following parts:
 - The retainer clip (215)
 - The pump ball seat (217)
 - The cut off ball (216)

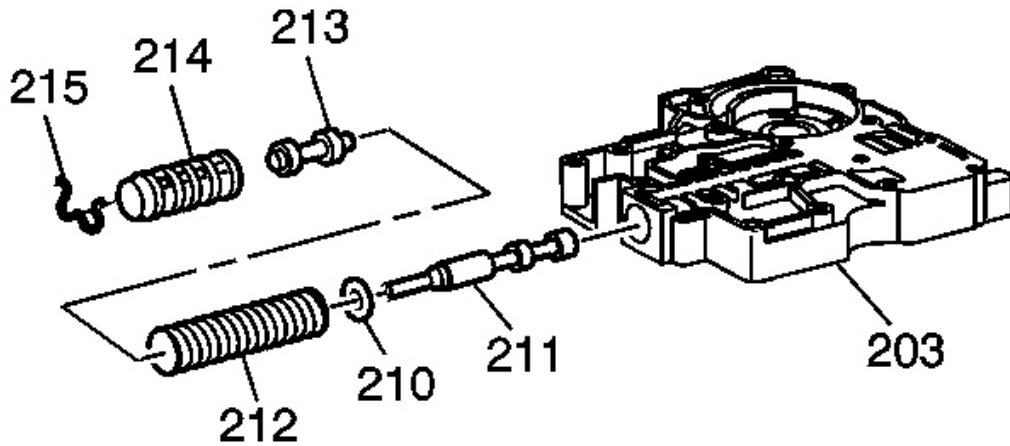


Fig. 242: Identifying Pressure Regulator Boost Valve & Pressure Regulator Valve
Courtesy of GENERAL MOTORS CORP.

2. Remove the following parts:

- The retainer clip (215)
- The pressure regulator boost valve sleeve (214)
- The pressure regulator boost valve (213)
- The pressure regulator valve spring (212)
- The pressure regulator spring retainer (210)
- The pressure regulator valve (211)

SECONDARY PUMP ASSEMBLY

NOTE: Use J 36850 or equivalent during assembly in order to retain checkballs or to lubricate components. Lubricants other than the recommended assembly lube changes the transmission fluid characteristics and causes undesirable shift conditions or filter clogging.

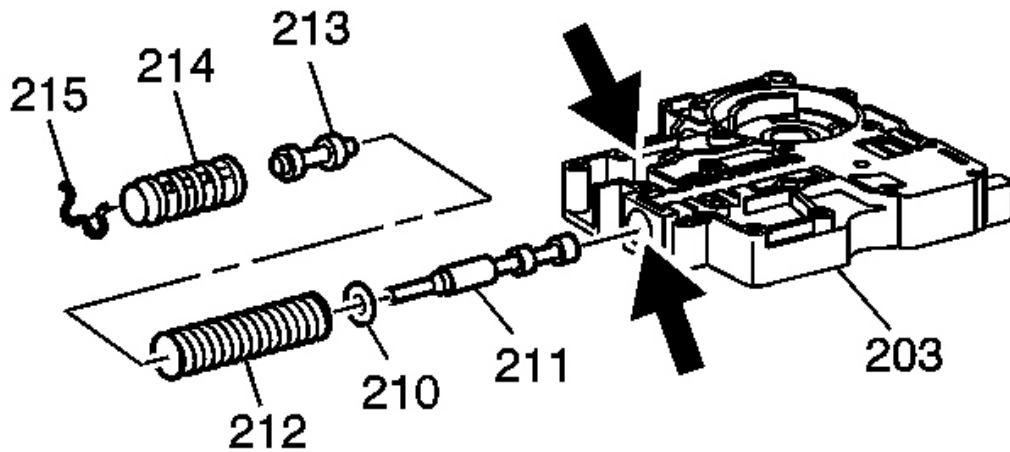


Fig. 243: Pressure Regulator Valve Bore Inspection Areas
Courtesy of GENERAL MOTORS CORP.

1. Inspect the pressure regulator valve bore for nicks or scoring.
2. Install the following parts:
 - The pressure regulator valve (211)
 - The pressure regulator spring retainer (210)
 - The pressure regulator valve spring (212)
 - The pressure regulator boost valve (213)
 - The pressure regulator boost valve sleeve (214)
 - The retainer clip (215)

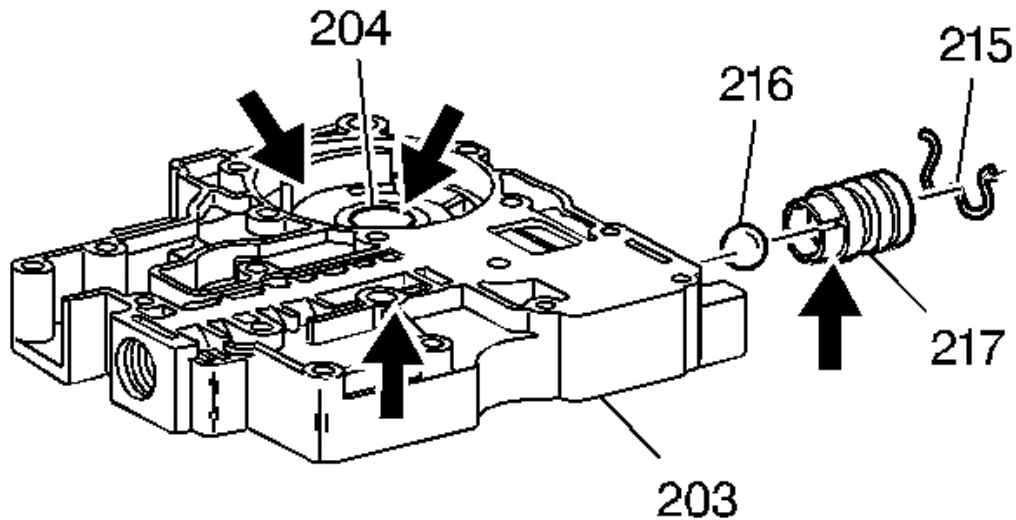


Fig. 244: Inspection Areas On Scavenge Pump
Courtesy of GENERAL MOTORS CORP.

3. Inspect the following for damage or nicks:
 - The scavenge pump bushing (204)
 - The secondary pump cover (203)
 - The pump ball seat (217)
4. Install the following parts:
 - The secondary pump cutoff ball (216)
 - The pump ball seat (217)
 - The retainer clip (215)

PUMP ASSEMBLE

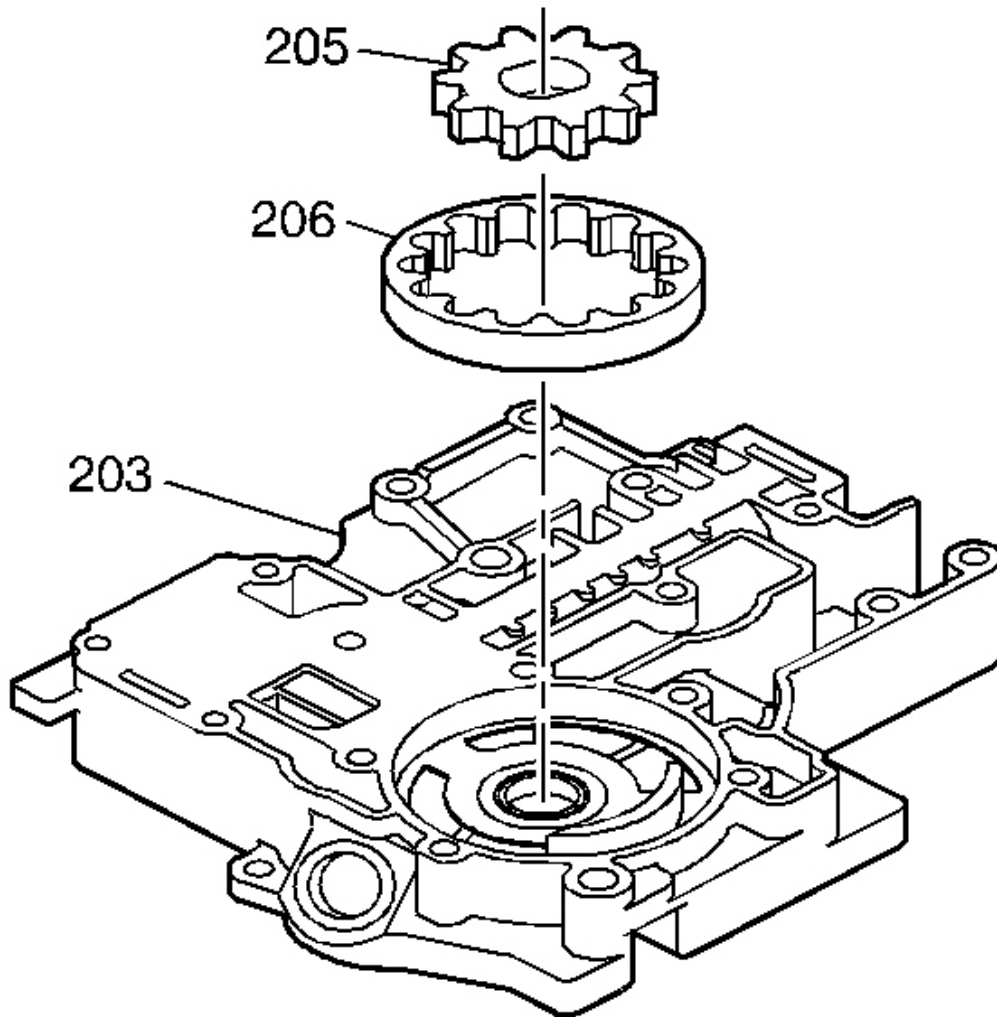


Fig. 245: Locating Secondary Pump Gears
Courtesy of GENERAL MOTORS CORP.

1. Install the secondary pump gears (205, 206) into the secondary pump body (203).

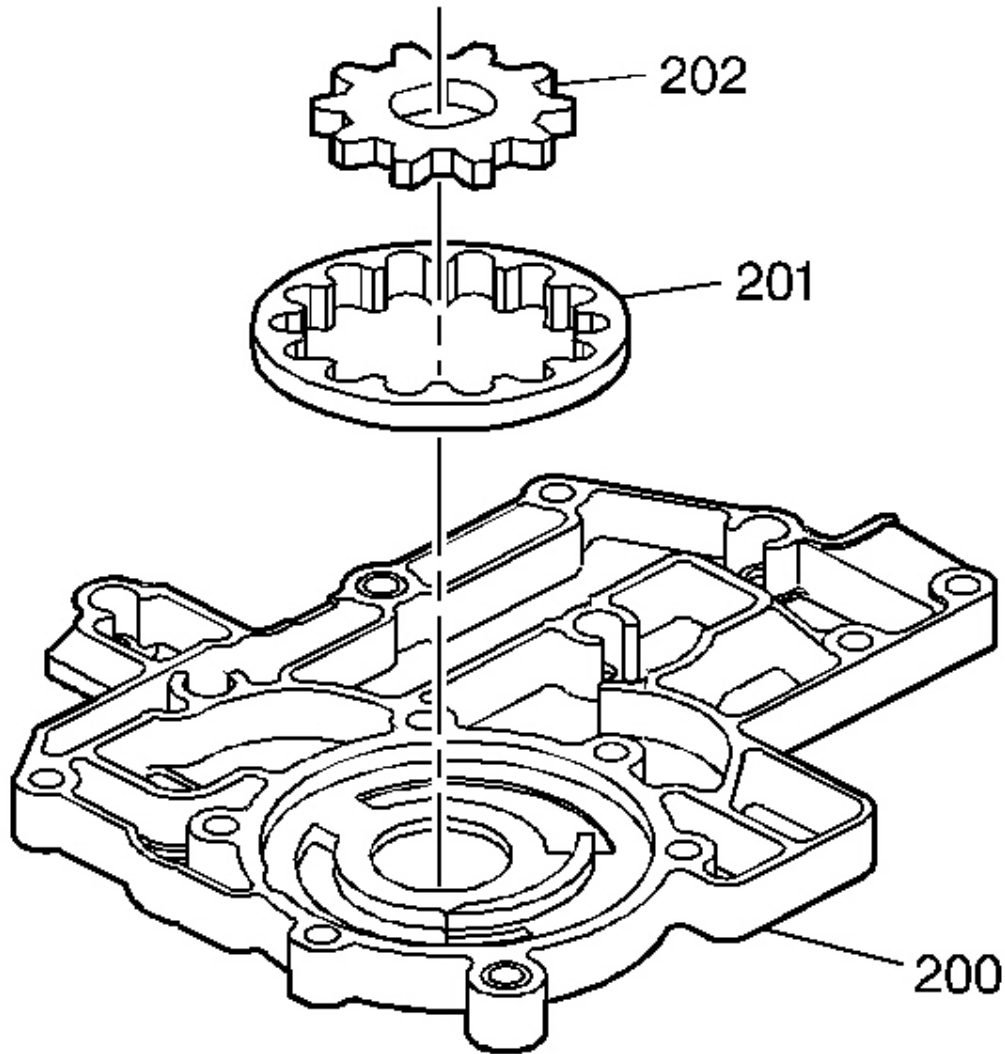


Fig. 246: Installing Primary Pump Gears
Courtesy of GENERAL MOTORS CORP.

2. Install the primary pump gears (201, 202) into the primary pump body (200).

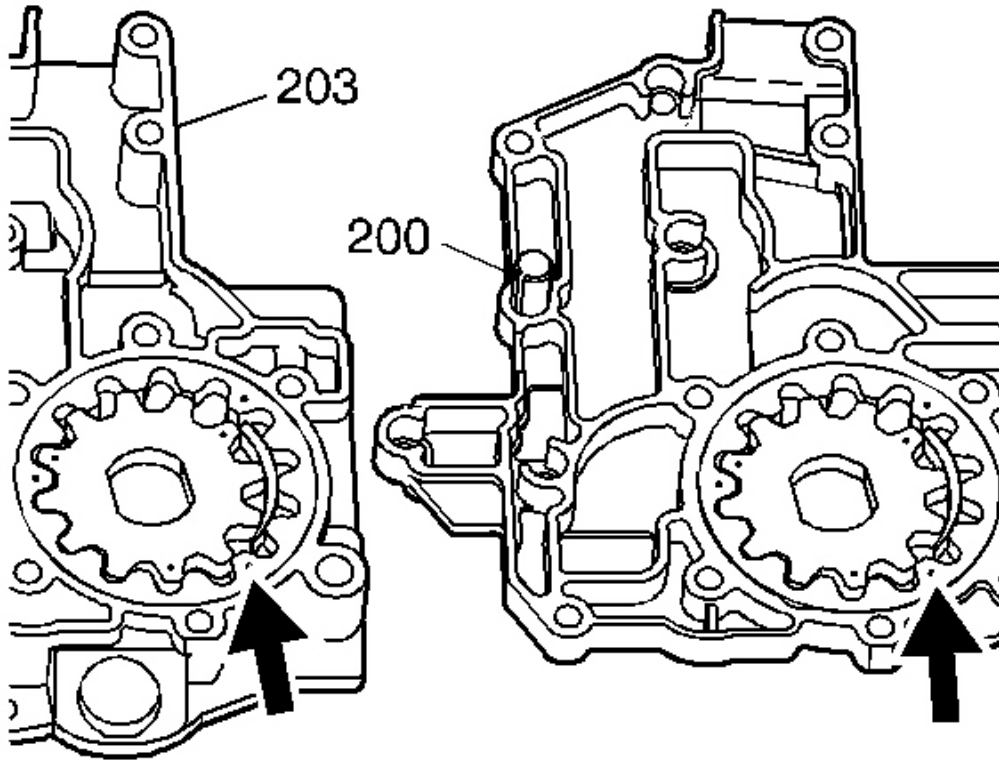


Fig. 247: Locating Dimples On Pump Gears
Courtesy of GENERAL MOTORS CORP.

3. Inspect the pump gears (201, 202, 205, 206). These gears must be installed with the dimples facing up.

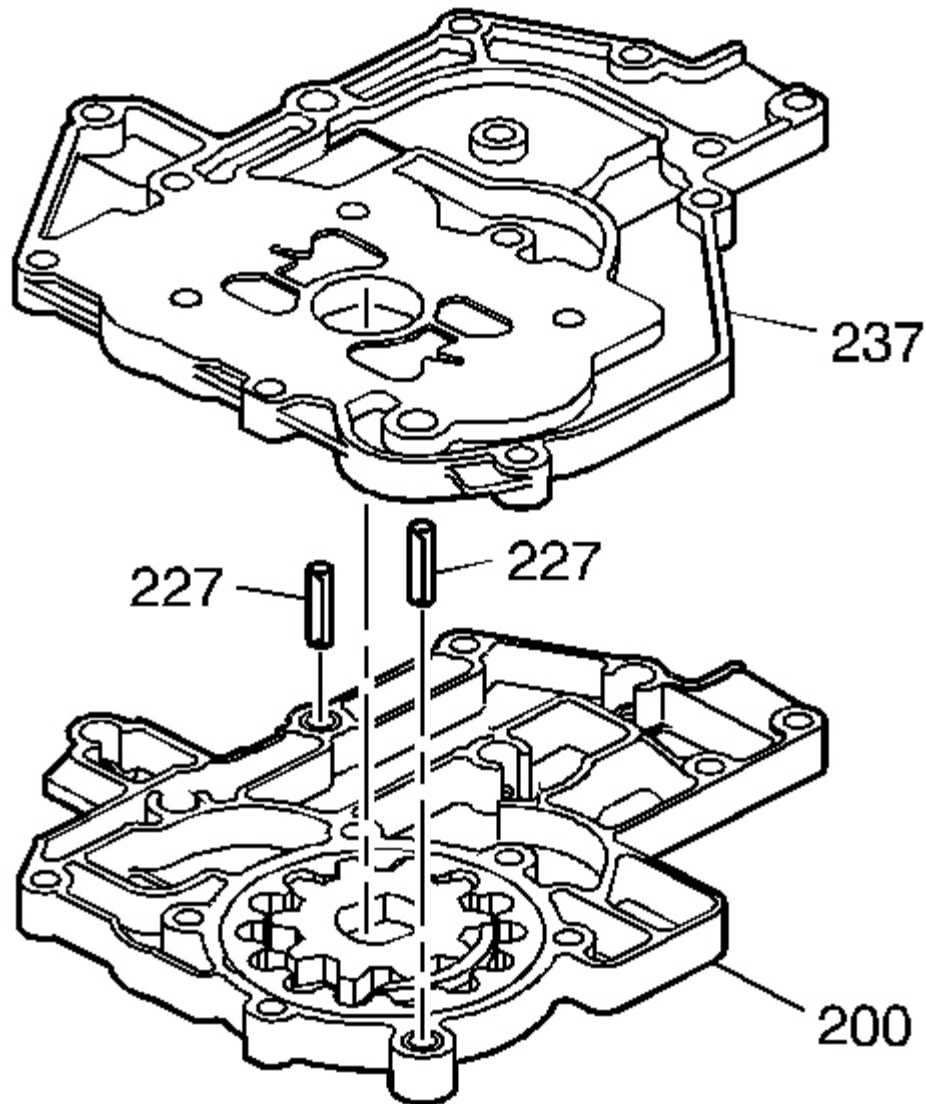


Fig. 248: Installing Scavenge Pump Cover Onto Primary Pump Body
Courtesy of GENERAL MOTORS CORP.

4. Install the scavenge pump cover (237) onto the primary pump body (200) over the dowel bushings (227). Tap the dowels in place to that they stick out of both the primary pump body and the scavenge cover.

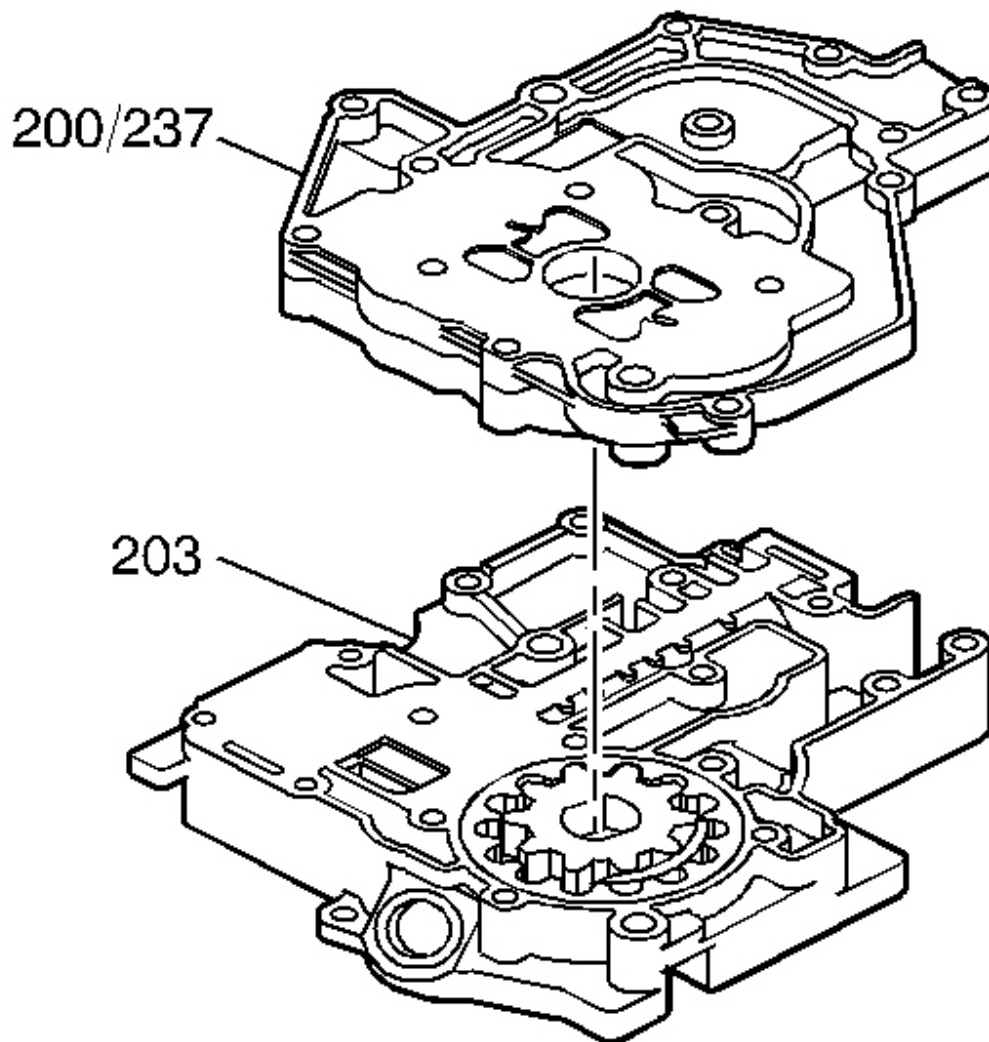


Fig. 249: View Of Scavenge Pump Cover, Primary Body Assembly & Secondary Pump Body

Courtesy of GENERAL MOTORS CORP.

5. Install the scavenge pump cover and primary body assembly (200/237) onto the secondary pump body (203). Press the entire assembly firmly together.

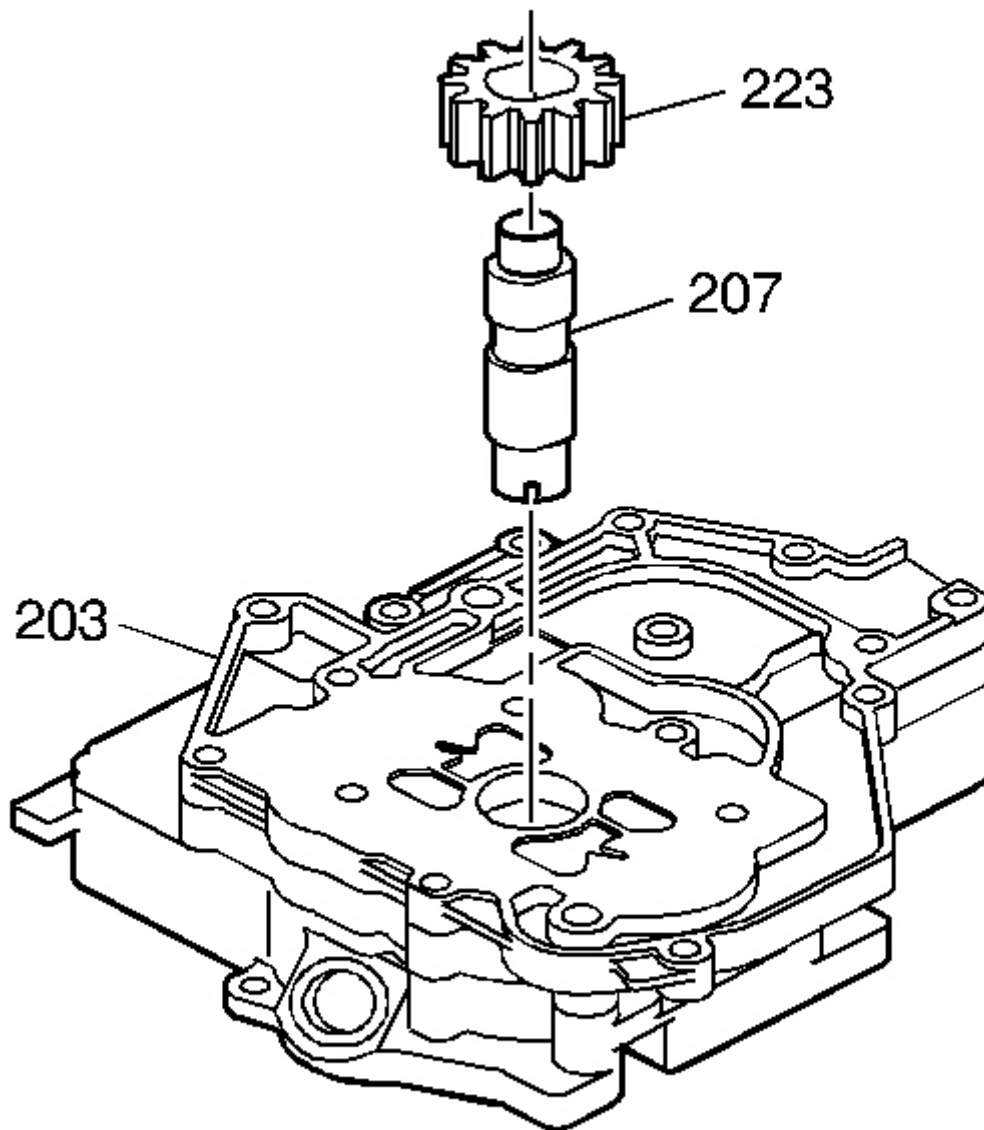


Fig. 250: Installing Oil Pump Driven Shaft
Courtesy of GENERAL MOTORS CORP.

6. Install the oil pump driven shaft (207) into the pump assembly. The end of the shaft with the four notches is located in the secondary pump.
7. Install the scavenge pump drive gear (223) over the pump driven shaft.

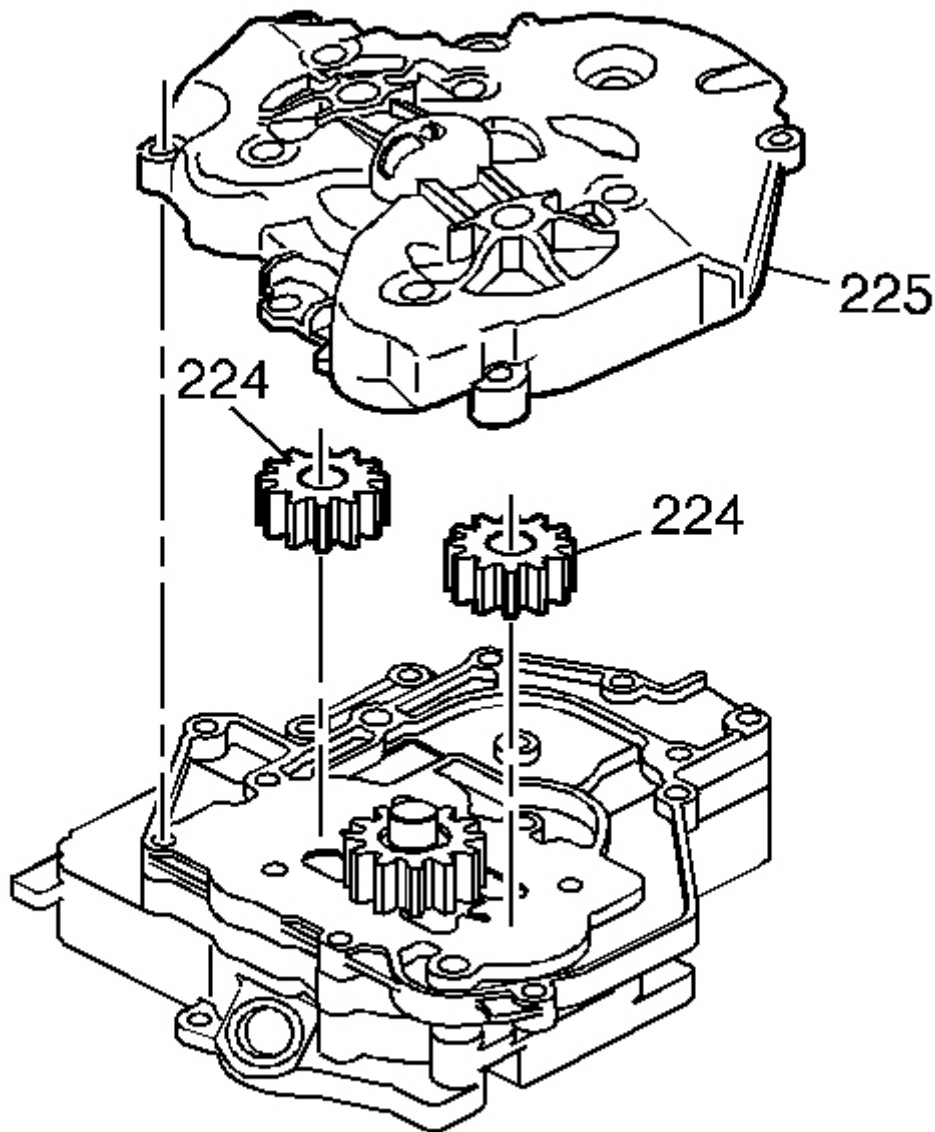


Fig. 251: Aligning Scavenge Pump Driven Gears
Courtesy of GENERAL MOTORS CORP.

8. Align the scavenge pump driven gears (224) next to the drive gear (223). Install the scavenge pump body (225) onto the scavenge pump cover. Locate the scavenge pump driven gear pins into the scavenge pump driven gears (224). Press firmly into position.

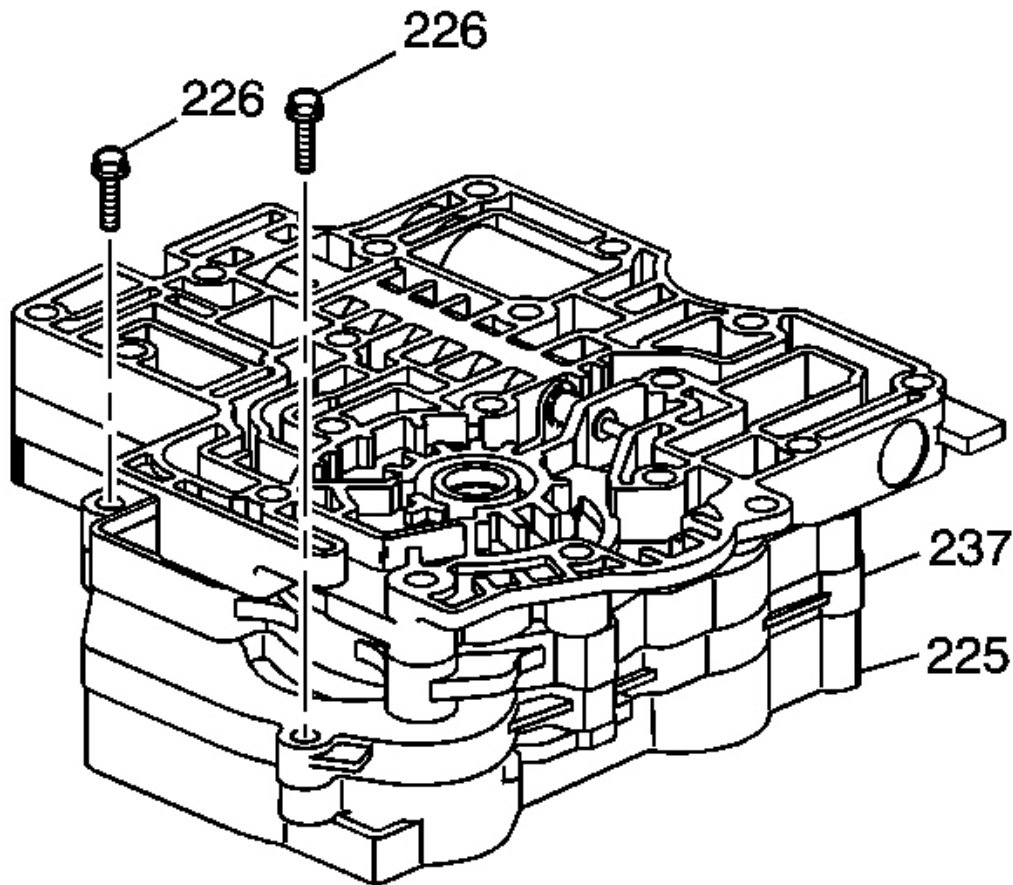


Fig. 252: Locating Scavenge Pump Cover Retaining Bolts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to FASTENER NOTICE in Cautions and Notices.

9. Install the two 10-mm bolts (226) through the scavenge pump cover (237) to the scavenge pump body (225).

Tighten: Tighten the bolts to 11-13 N.m (8.0-9.5 lb ft).

PUMP INSTALLATION

Tools Required

J 39068 Pump Assembly Guide Pins

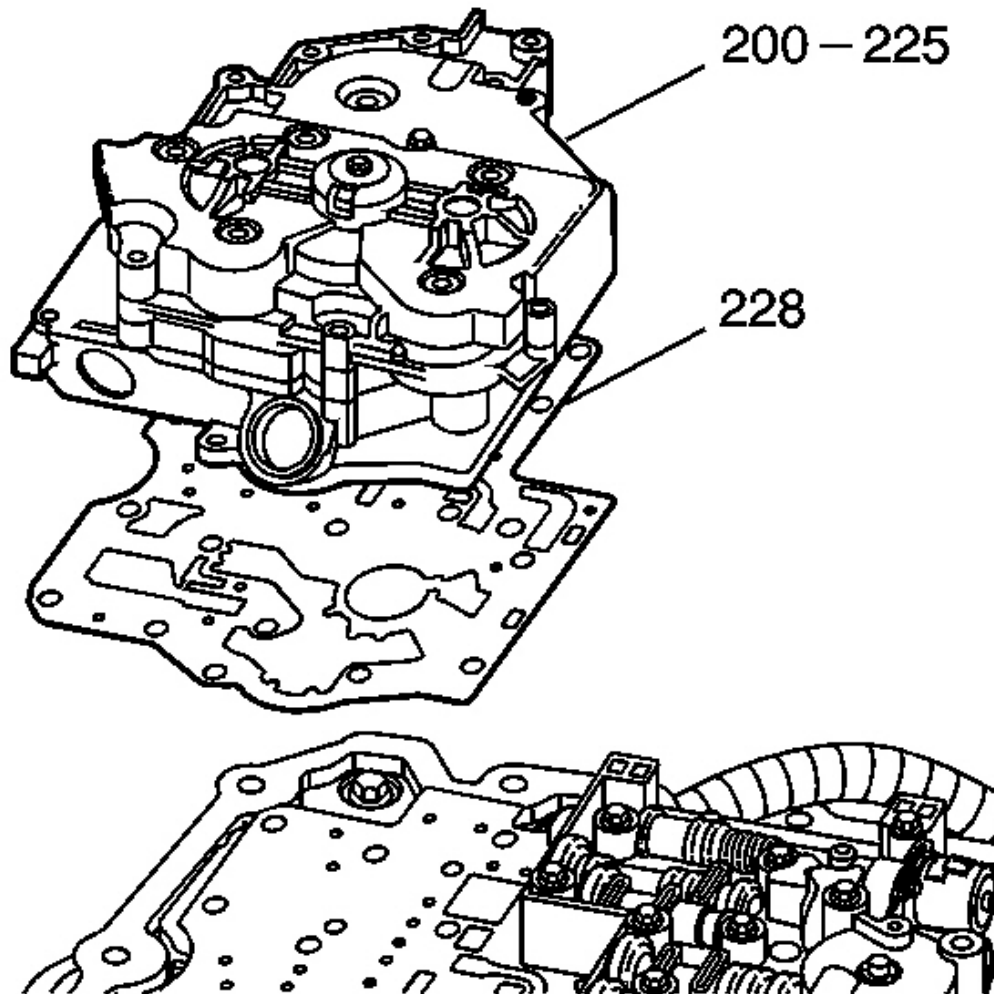


Fig. 253: View Of Scavenge, Primary And Secondary Pump Assemblies
Courtesy of GENERAL MOTORS CORP.

1. Install the **J 39068** into the case.
2. Install the new gasket (228).
3. Install the pump assembly (200-225).

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

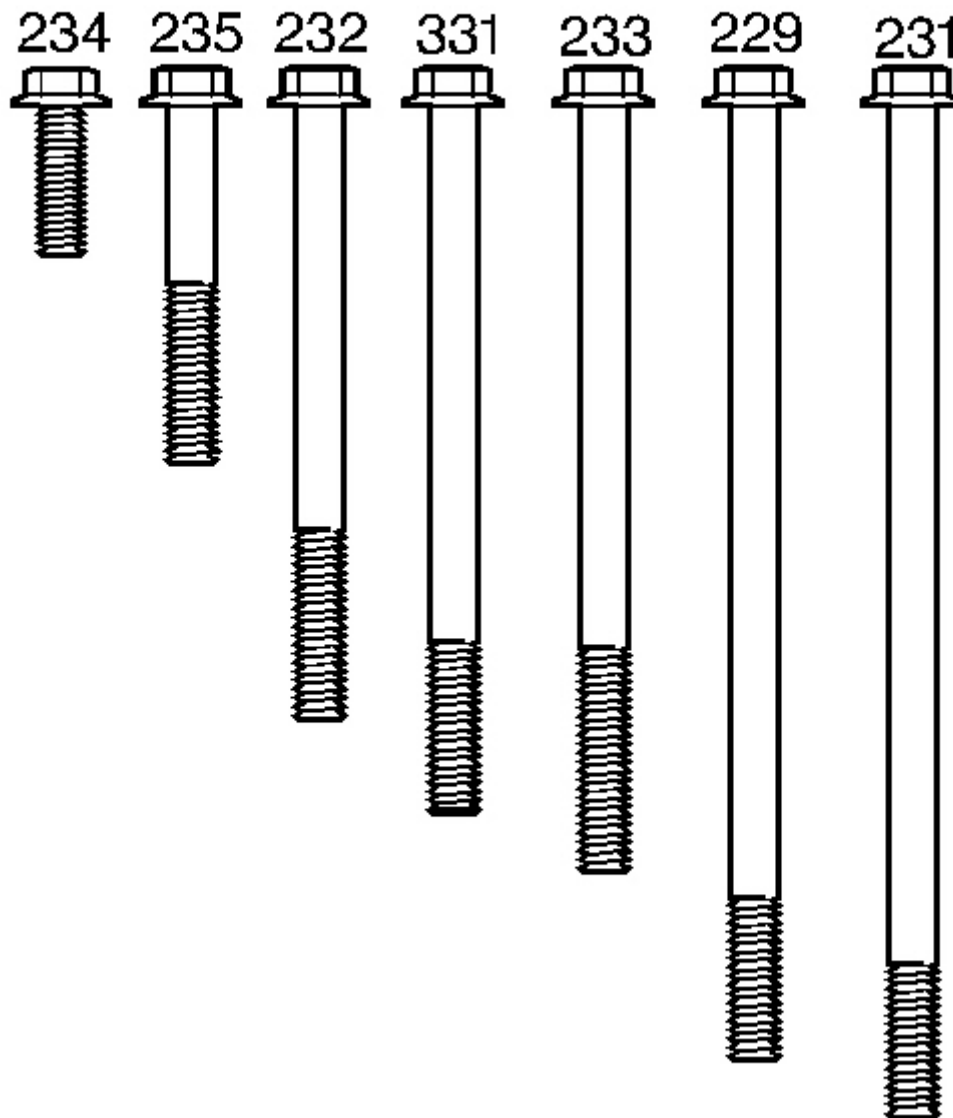


Fig. 254: Identifying Scavenge Pump Bolts
Courtesy of GENERAL MOTORS CORP.

4. Apply pipe thread sealant, GM P/N 12346004 to pump bolt threads before installation.
5. Hand start all of the bolts (229, 231, 232, 233, 234, 235, 331).

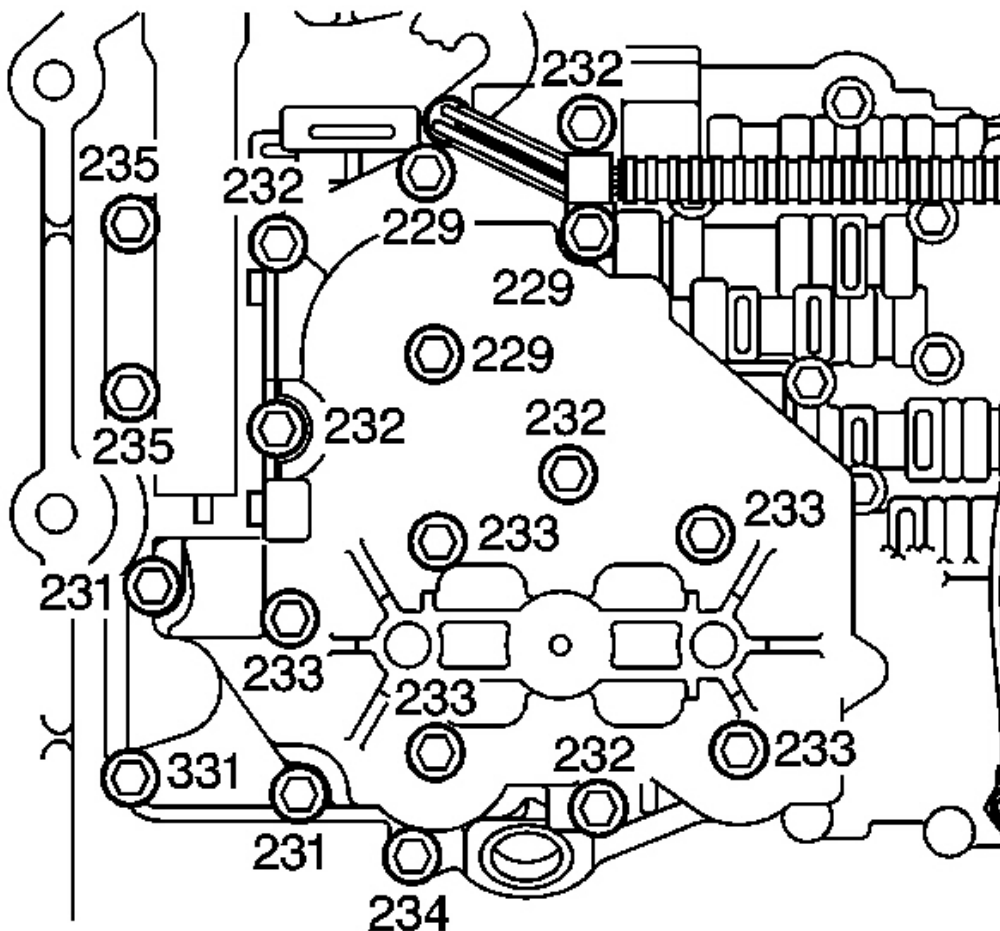


Fig. 255: Identifying Pump Housing Bolts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to **FASTENER NOTICE** in Cautions and Notices.

6. Remove the guide pins and install the remaining bolts.

Tighten: Tighten the bolts in sequence in a clockwise pattern to 11-13 N.m (8.0-9.5 lb ft).

TEMPERATURE SENSOR, TORQUE CONVERTER CLUTCH SOLENOID, AND PRESSURE CONTROL SOLENOID VALVE ASSEMBLE

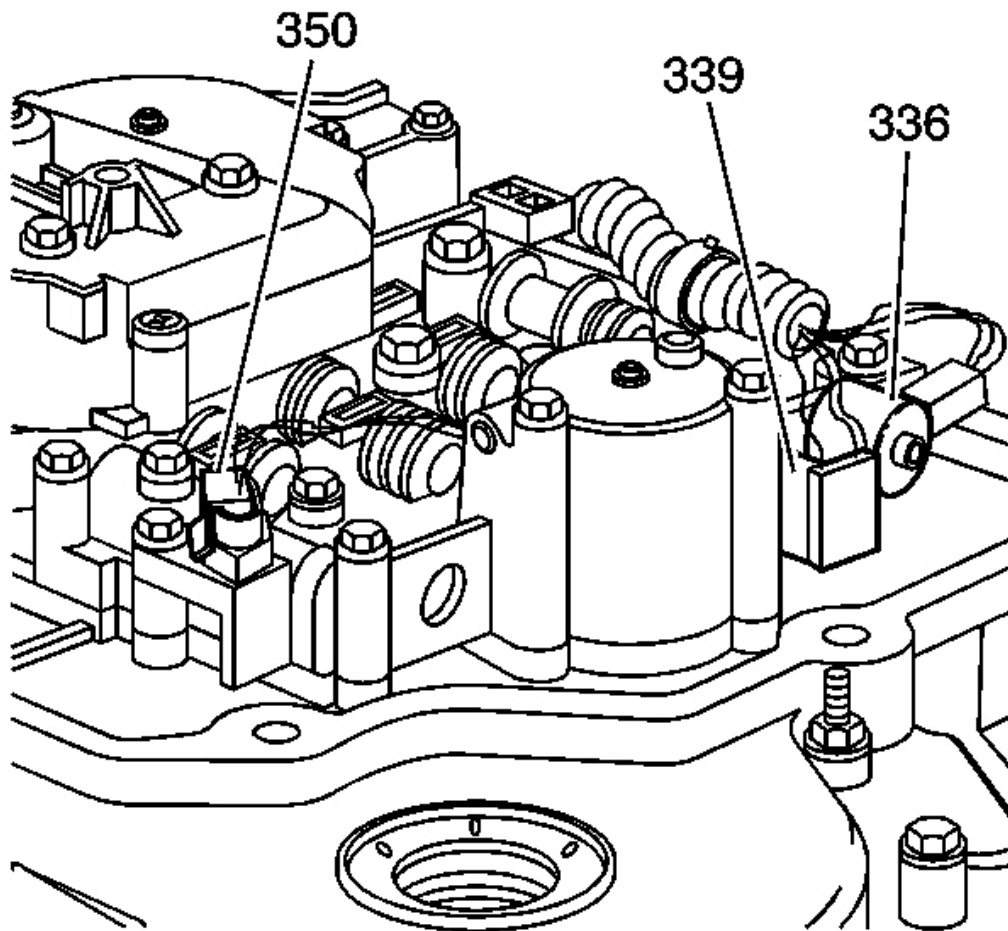


Fig. 256: View Of Pressure Control Solenoid Valve, Torque Converter Clutch Solenoid Valve & Transmission Temperature Sensor Electrical Connectors
Courtesy of GENERAL MOTORS CORP.

Connect the wiring harness to the following:

- The pressure control solenoid valve (339)
- The torque converter clutch solenoid valve (336)
- The temperature sensor (350)

OIL FILTER AND SIDE COVER INSTALL

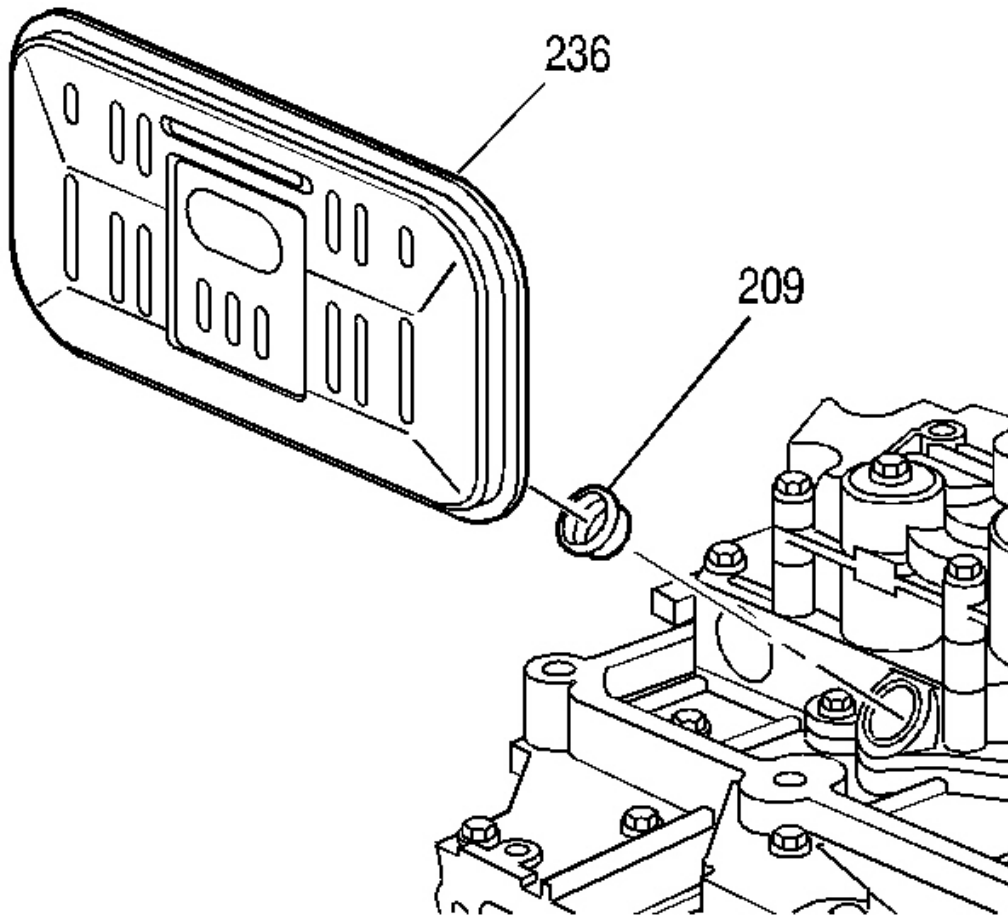


Fig. 257: View Of Oil Filter & Seal
Courtesy of GENERAL MOTORS CORP.

1. Install the new filter seal (209) and the new oil filter (236).

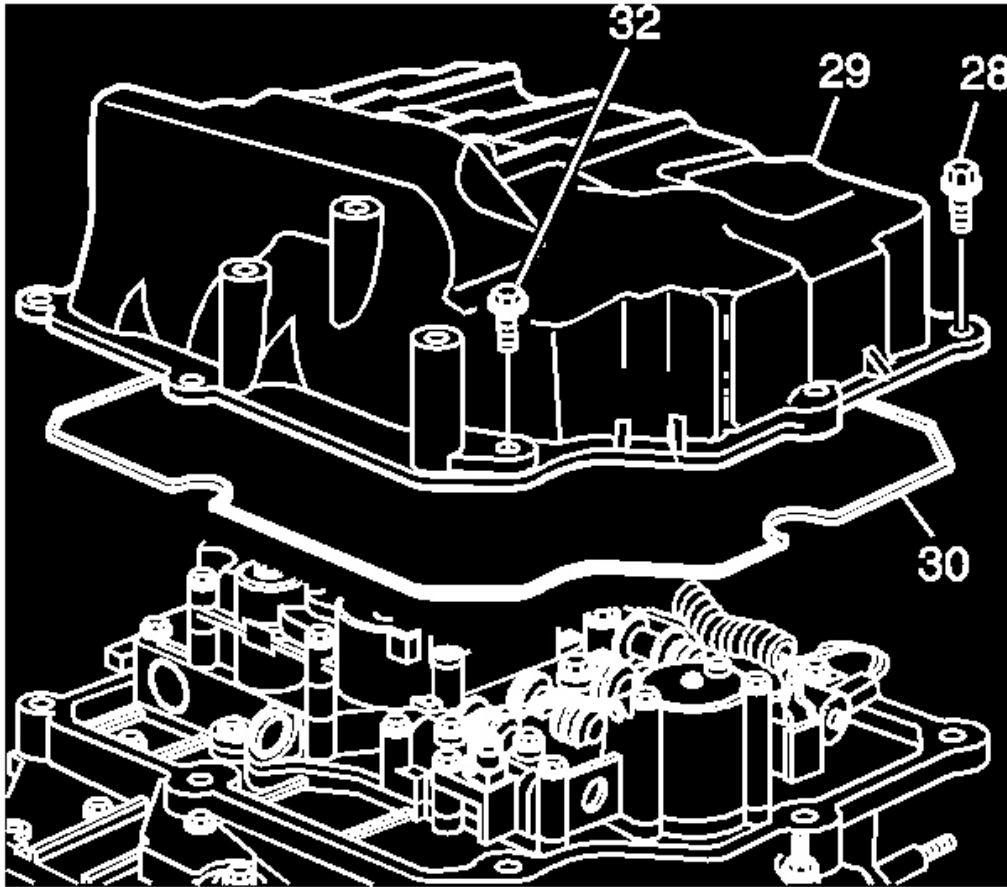


Fig. 258: Locating Side Cover & Gasket
Courtesy of GENERAL MOTORS CORP.

2. Install the gasket (30) into the side cover (29).
3. Install the side cover (29) onto the case cover.

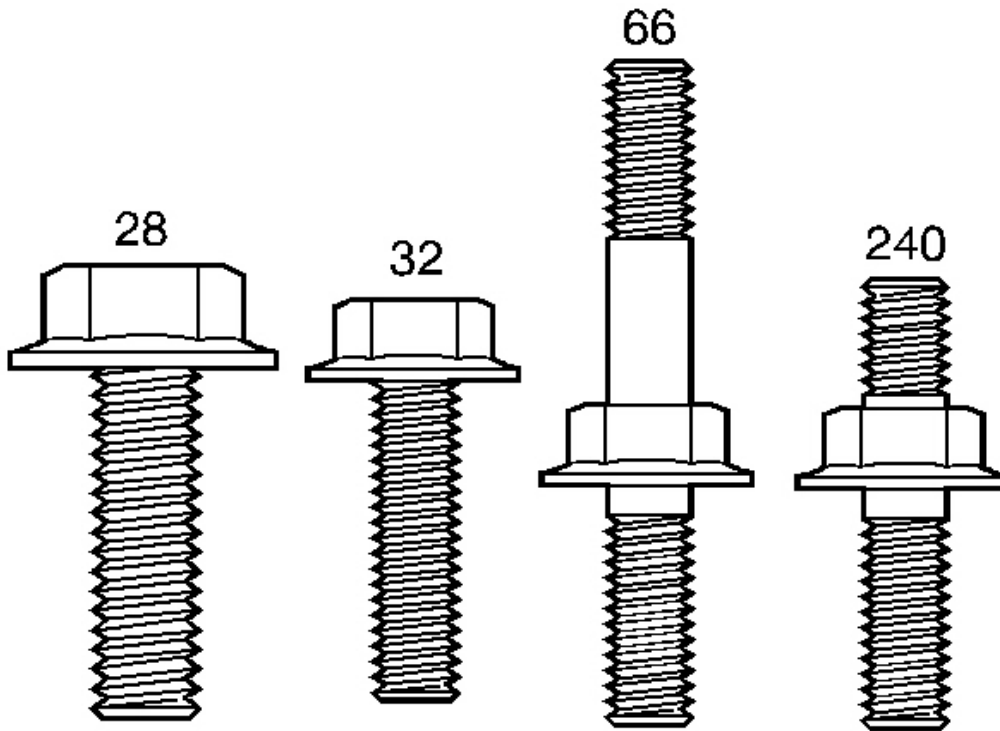


Fig. 259: Identifying Side Cover Bolts
Courtesy of GENERAL MOTORS CORP.

4. Install the side cover bolts (28, 32).
5. Some models may also use stud bolts (66 or 240).

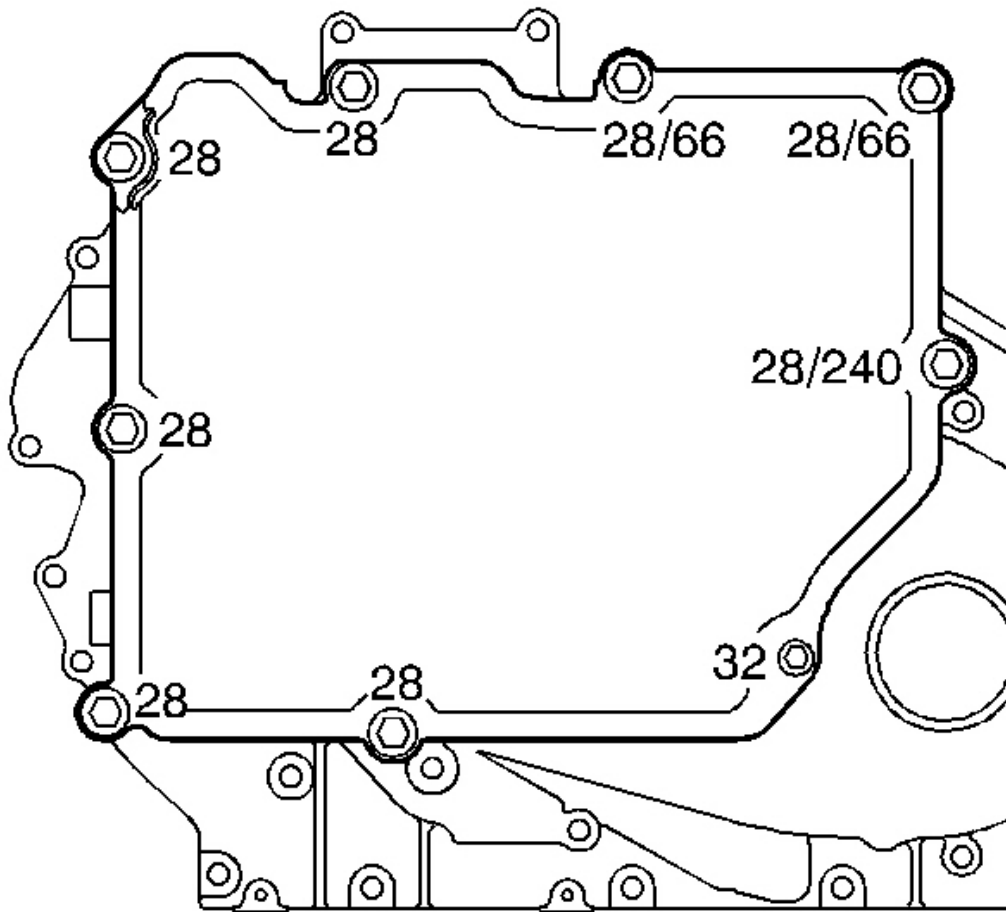


Fig. 260: Installing Side Cover Bolts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to **FASTENER NOTICE** in Cautions and Notices.

6. Apply GM sealing adhesive 12346004 before installing the bolt (32).

Tighten:

- Tighten bolts (28, 66, 240) to 50-55 N.m (37-40 lb ft).
- Tighten bolt (32) to 20-27 N.m (15-20 lb ft).

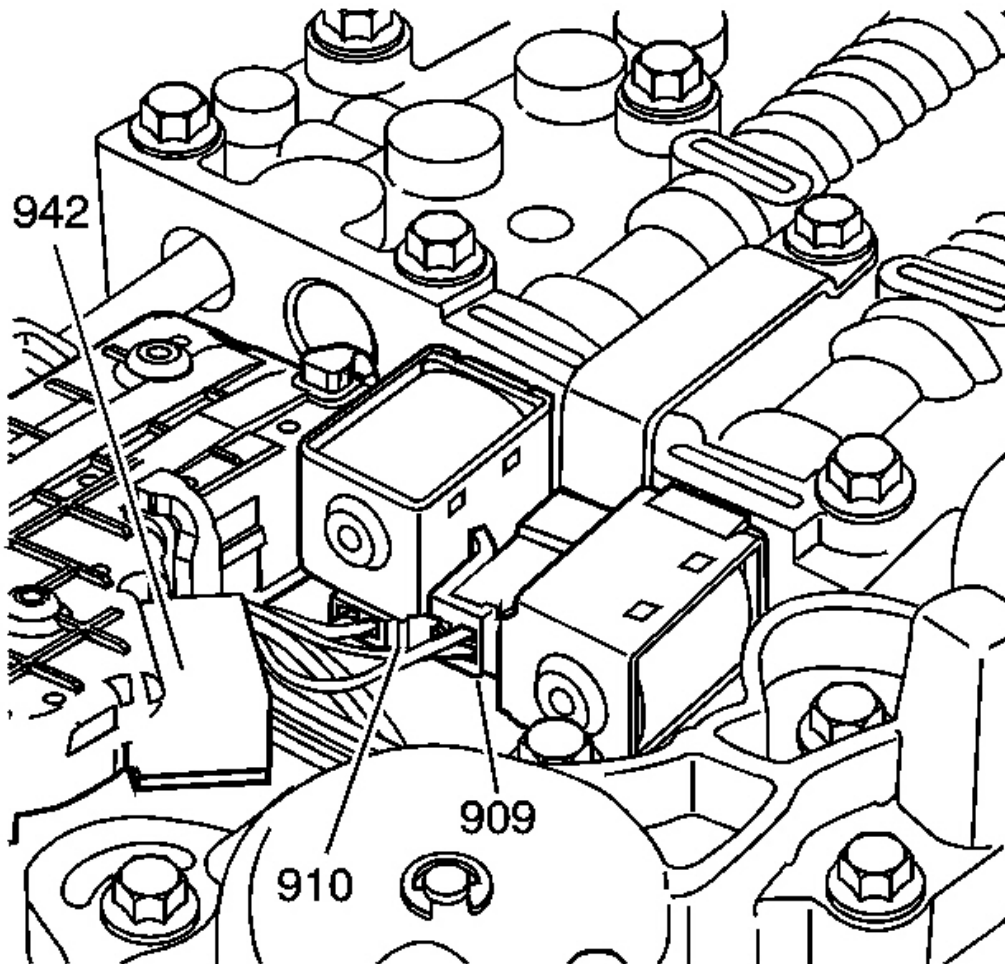


Fig. 261: Internal Mode Switch
Courtesy of GENERAL MOTORS CORP.

1. Use a small screwdriver in order to disconnect the electrical connectors from the following parts:
 - 1-2 shift solenoid valve (909)
 - 2-3 shift solenoid valve (910)
 - Internal mode switch (IMS) (942)

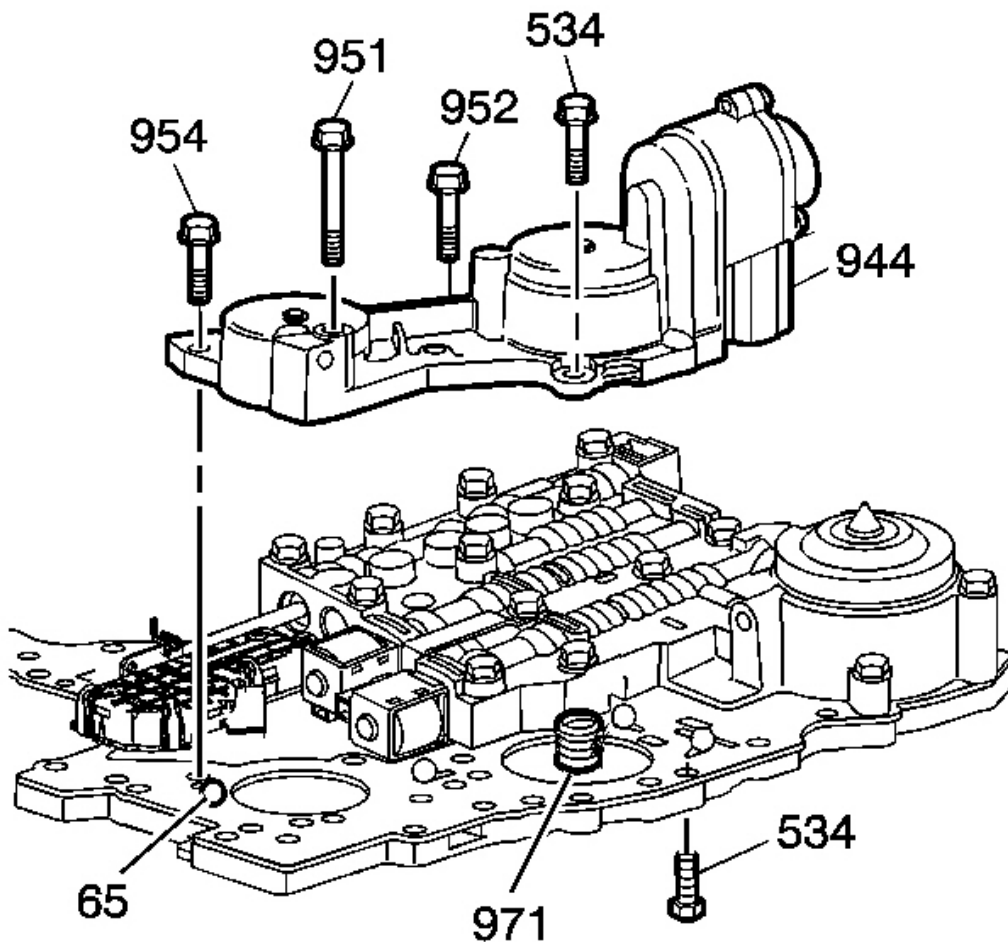


Fig. 262: Accumulator Housing
Courtesy of GENERAL MOTORS CORP.

2. Remove the 3, 10 mm bolts (534) from the channel plate side.
3. Remove the 6, 10 mm bolts (534, 951, 952, 954) from the accumulator housing.

IMPORTANT: There are 4 checkballs (65) and a spring (971) under the accumulator housing (944).

4. Remove the accumulator housing (944) from the channel plate.

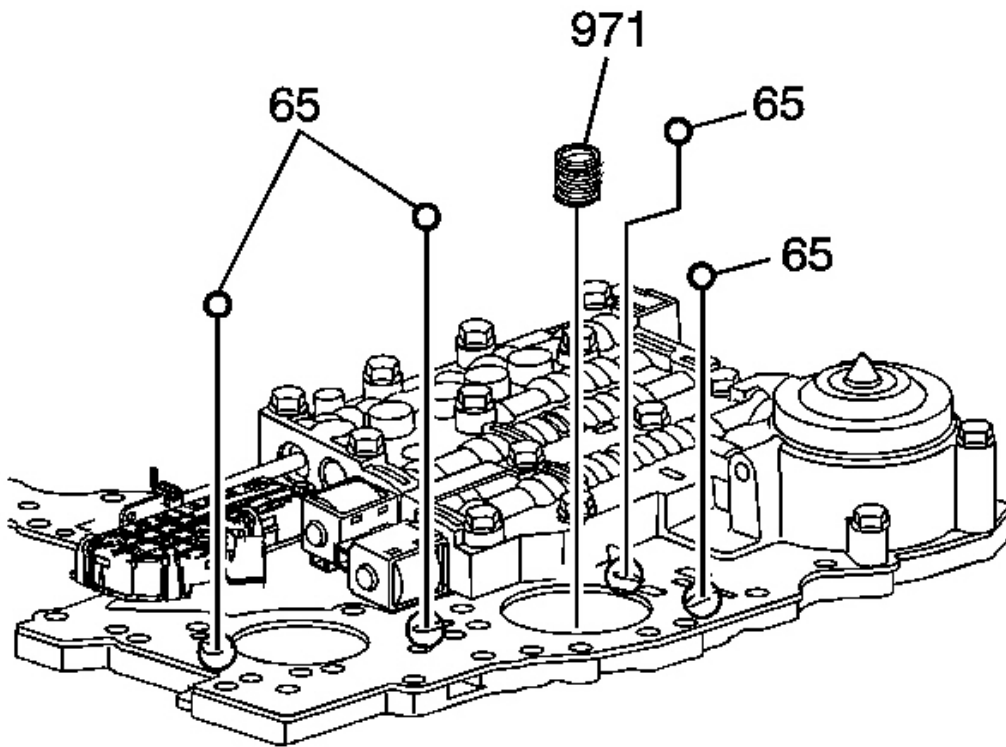


Fig. 263: Channel Plate
Courtesy of GENERAL MOTORS CORP.

5. Remove the 4 checkballs (65) and the spring (971) from the channel plate.

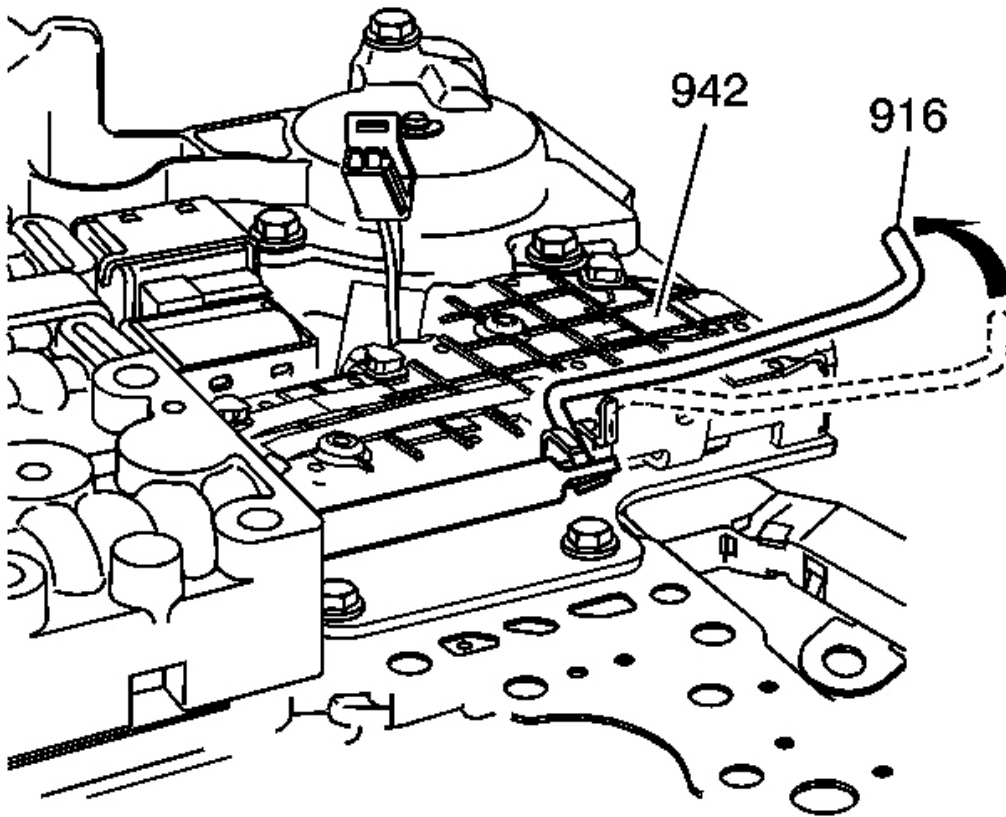


Fig. 264: Link Assembly & Internal Mode Switch
Courtesy of GENERAL MOTORS CORP.

6. In order to disconnect the manual valve and link assembly (916) from the internal mode switch (IMS) (942), rotate the manual valve and link assembly (916) toward the IMS (942).

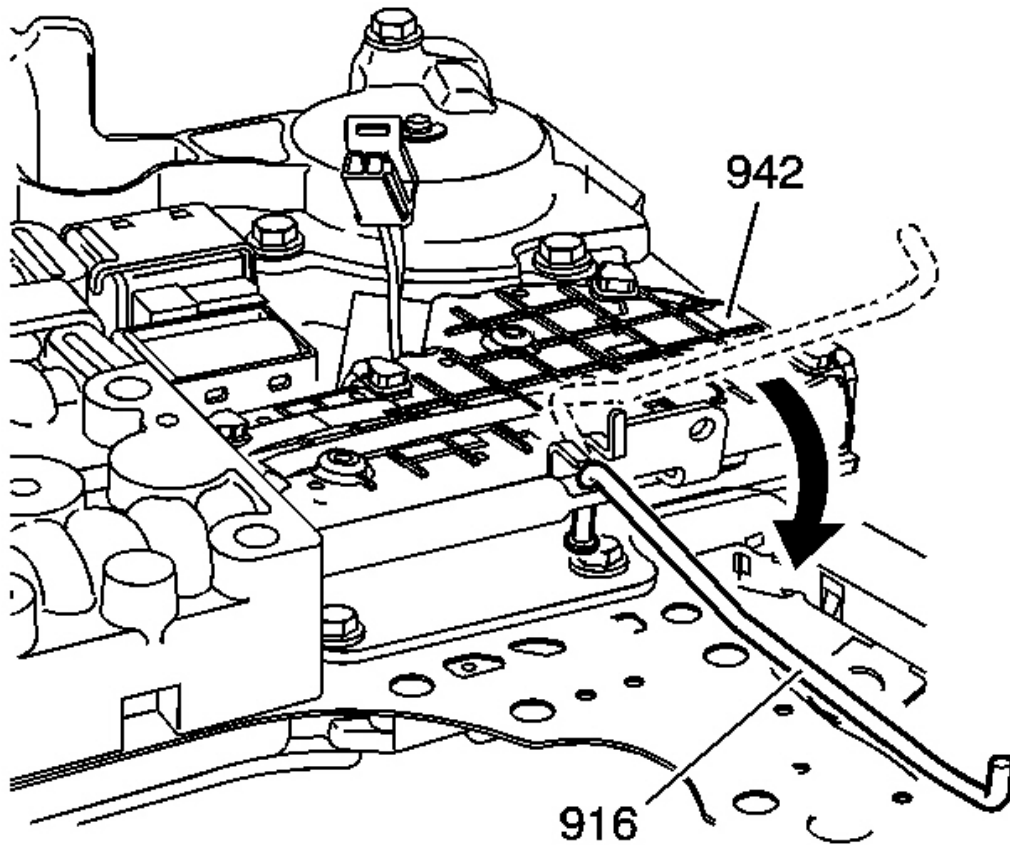


Fig. 265: Internal Mode Switch (IMS)
Courtesy of GENERAL MOTORS CORP.

7. Turn the manual valve link 90 degrees and rotate the manual valve and link assembly (916) away from the IMS (942).

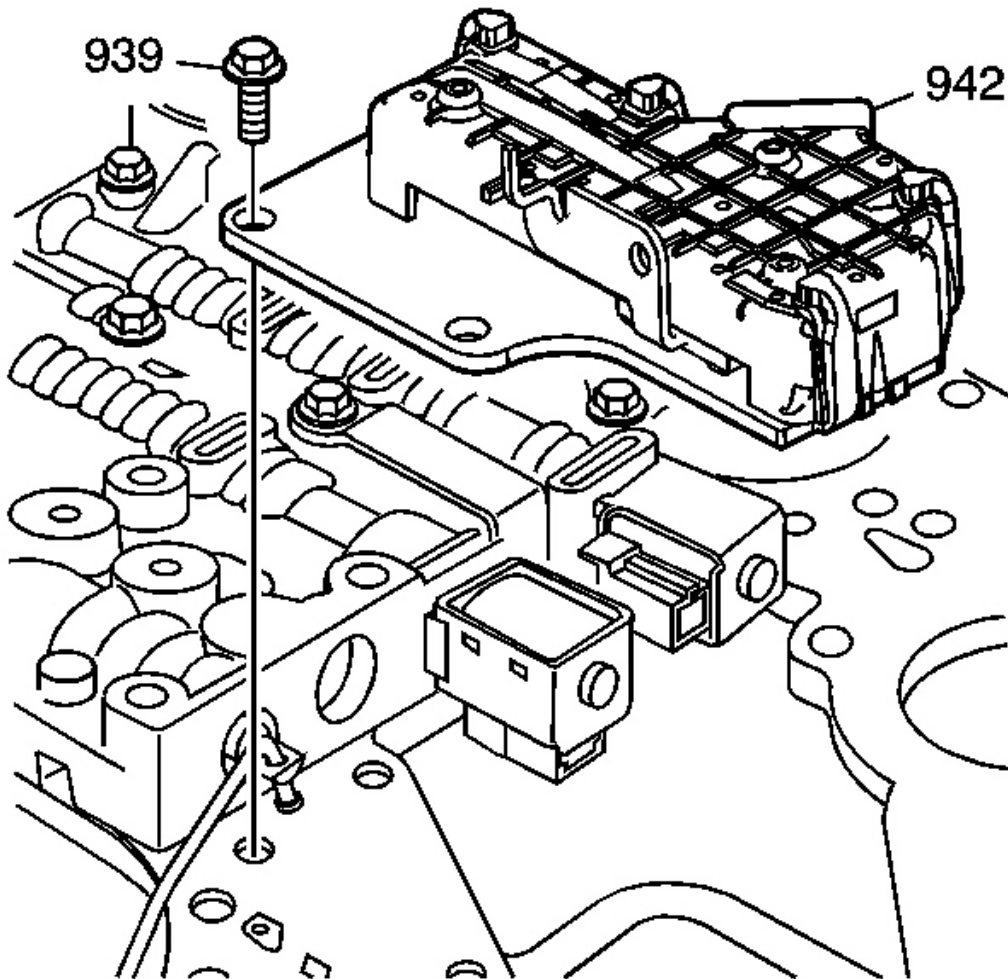


Fig. 266: Internal Mode Switch (IMS) Bolt
Courtesy of GENERAL MOTORS CORP.

8. Remove the 3, 8 mm bolts (939) from the internal mode switch (IMS) (942).
9. Remove the IMS (942).

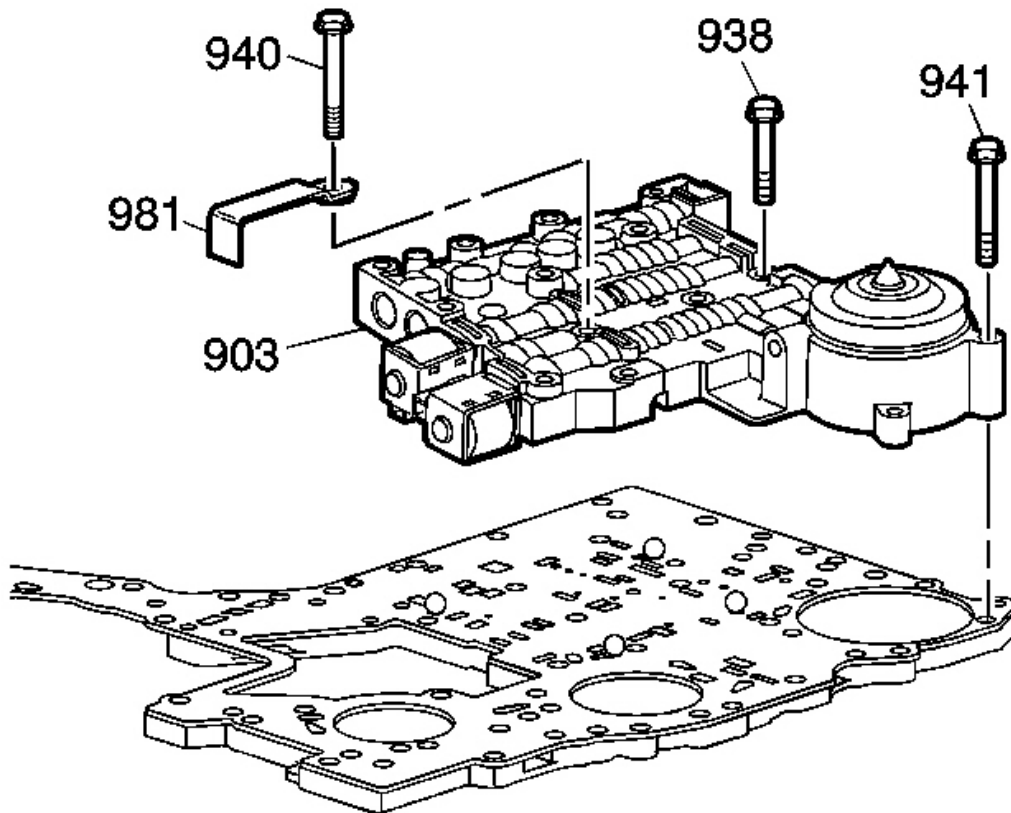


Fig. 267: Identifying Lower Control Valve Assembly Retaining Bolts
Courtesy of GENERAL MOTORS CORP.

10. Remove the 15, 10 mm bolts (938, 940, 941) from the lower control valve body.
11. Remove the solenoid valve fluid filter retainer (981).
12. Remove the lower control valve assembly (903) from the channel plate.

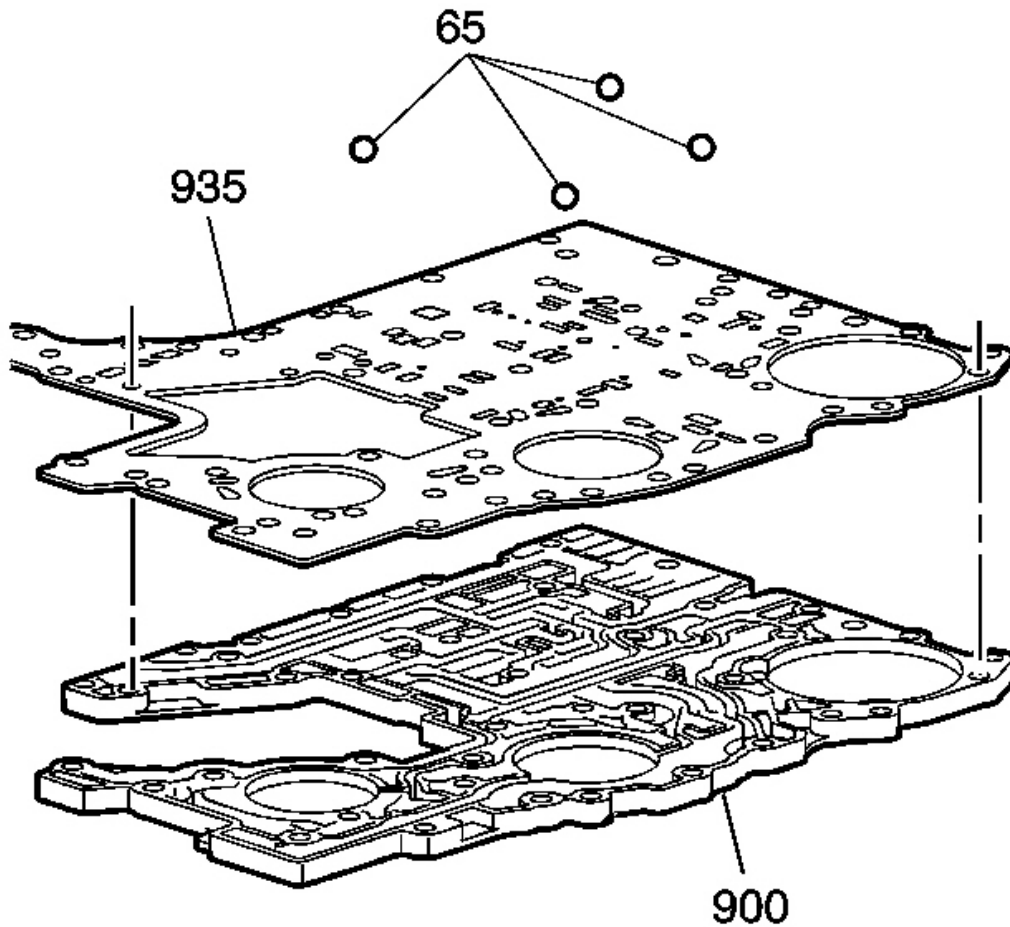


Fig. 268: View Of Channel Plate & Spacer Plate
Courtesy of GENERAL MOTORS CORP.

13. Remove the 4 checkballs (65).
14. Remove the spacer plate and gasket assembly (935) from the channel plate (900).

LOWER CONTROL VALVE BODY DISASSEMBLE



1. Remove the low/reverse servo piston retaining ring (932).
2. Push on the low/reverse apply pin (931) to remove the low/reverse servo assembly from the control valve body.
3. Remove the return spring (901).
4. Remove the retaining ring (902) from the low/reverse servo assembly and push out the servo pin (931).
5. Remove the following parts:

- The servo cushion spring (934)
 - The sleeve (980)
 - The spring washer (933)
6. Inspect the following items for damage:
- The low/reverse servo piston (928)
 - The low/reverse servo seals (929, 930)

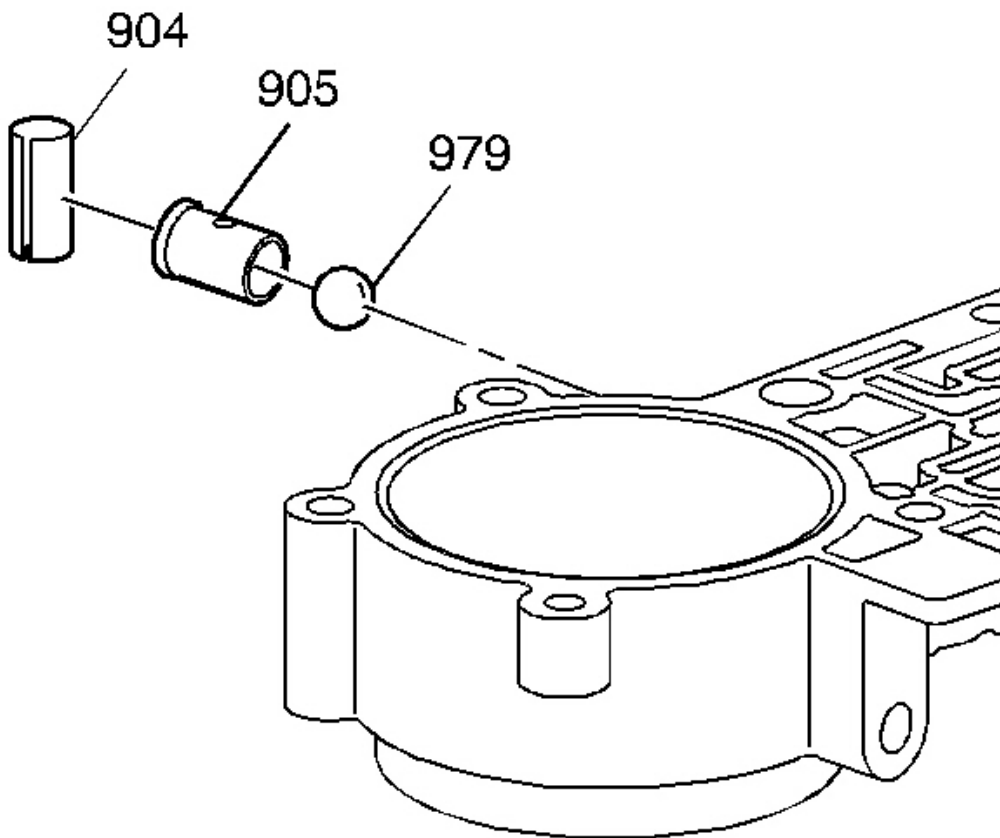


Fig. 270: Identifying Ball Check Capsule
Courtesy of GENERAL MOTORS CORP.

7. Remove the following parts:
- The spring retainer (904)

- The ball check capsule (905)
 - The ball (979)
8. Inspect all parts for scratches, debris, and damage.

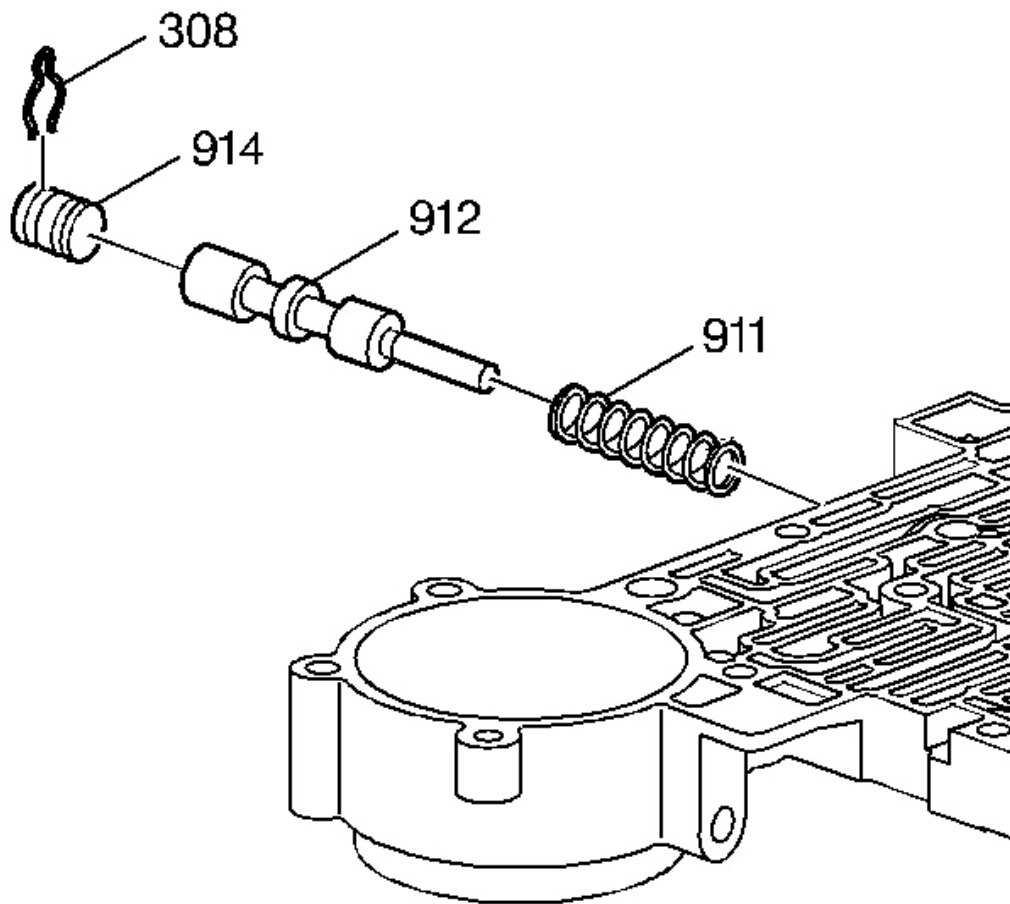


Fig. 271: Locating 3-4 Shift Valve Assembly
Courtesy of GENERAL MOTORS CORP.

9. Remove the following parts:
- The retainer clip (308)
 - The bore plug (914)
 - The 3-4 shift valve (912)

- The 3-4 shift valve spring (911)

10. Inspect the 3-4 shift valve (912) for scratches or debris.

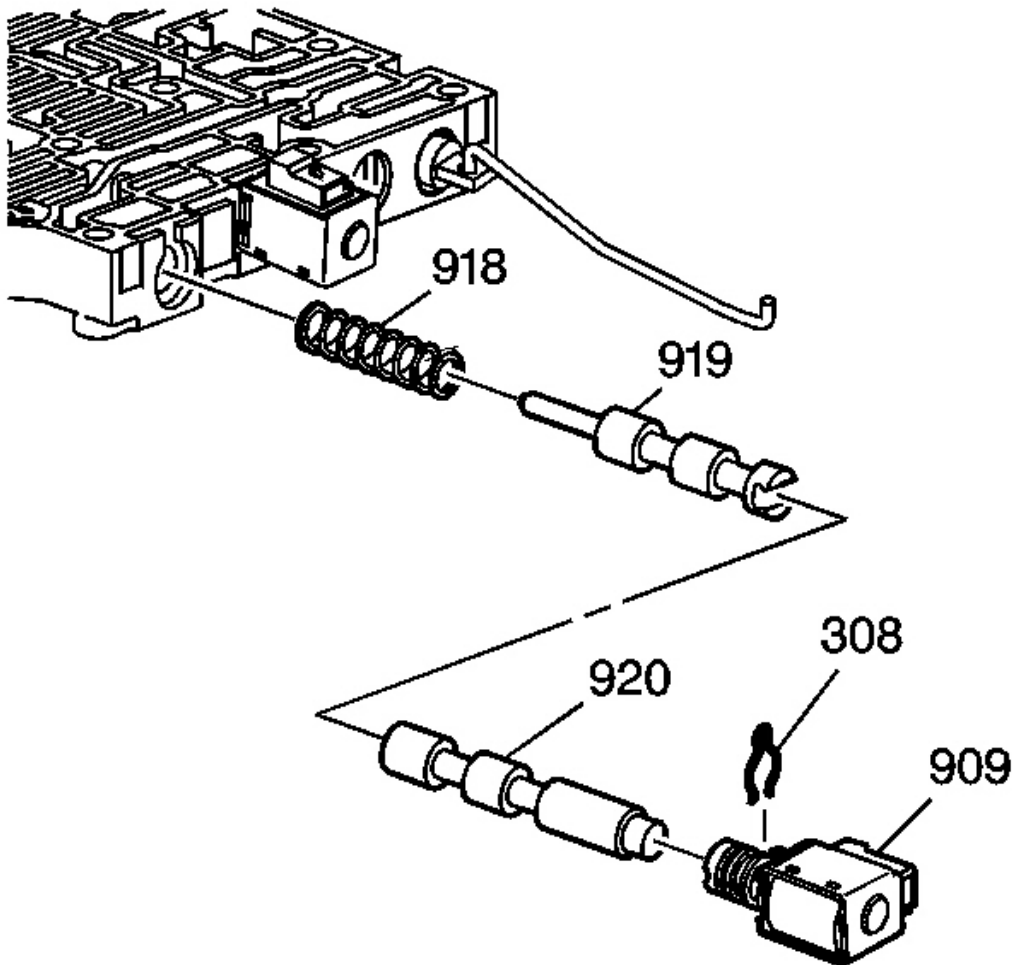


Fig. 272: 1-2 Shift Solenoid Valve
Courtesy of GENERAL MOTORS CORP.

11. Remove the following parts:

- The retainer clip (308)
- The 1-2 shift solenoid valve (909)
- The 1-2 shift valve B (920)

- The 1-2 shift valve A (919),
 - The 1-2 shift valve spring (918)
12. Inspect the 1-2 shift solenoid valve (909) for damage.
 13. Inspect the 1-2 shift valves A and B (919, 920) for scratches or debris.

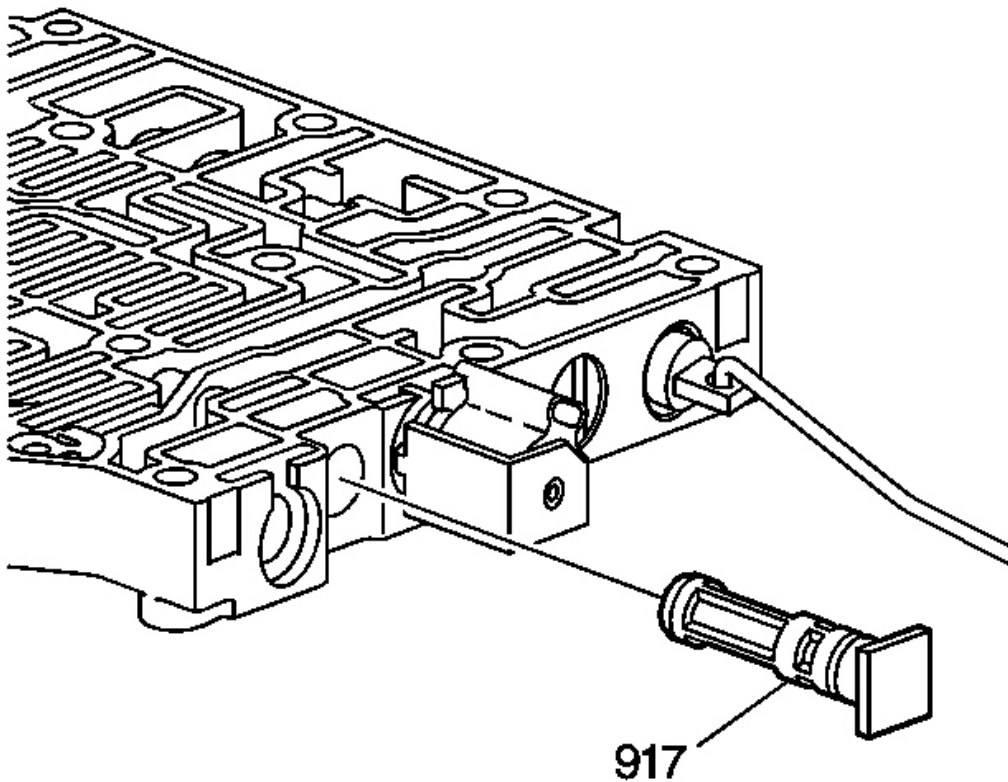


Fig. 273: Solenoid Screen Assembly
Courtesy of GENERAL MOTORS CORP.

14. Remove the solenoid screen assembly (917).
15. Inspect the solenoid screen assembly (917) for excessive debris.

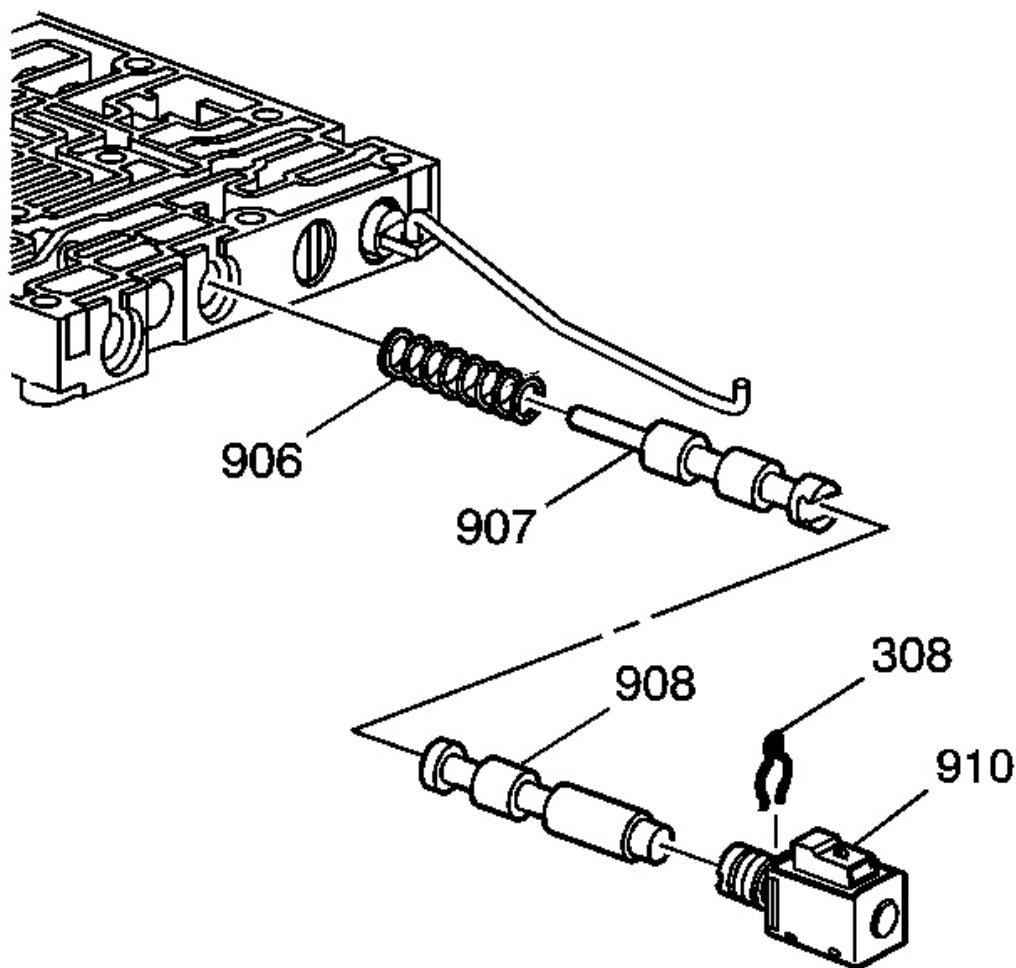


Fig. 274: 2-3 Shift Solenoid Valve
Courtesy of GENERAL MOTORS CORP.

16. Remove the following parts:

- The retainer clip (308)
- The 2-3 shift solenoid valve (910)
- The 2-3 shift valve D (908)
- The 2-3 shift valve C (907)
- The 2-3 shift valve spring (906)

17. Inspect the 2-3 shift solenoid valve (910) for damage.

18. Inspect the 2-3 shift valves C and D (907, 908) for scratches or debris.

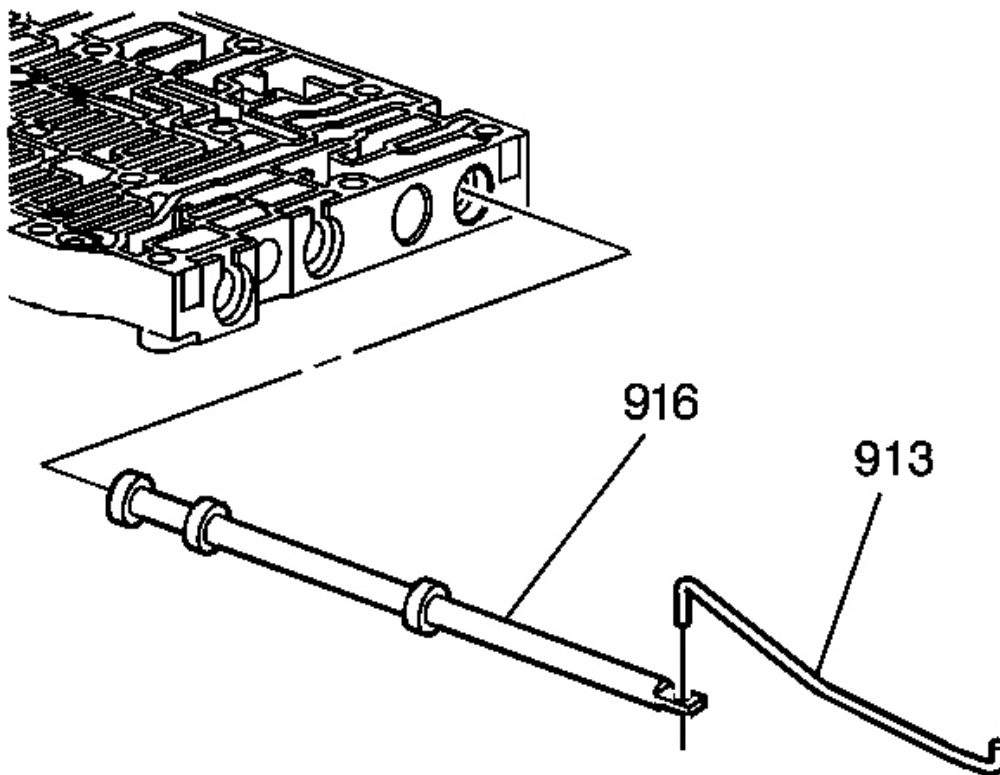


Fig. 275: Manual Valve & Link
Courtesy of GENERAL MOTORS CORP.

19. Remove the manual valve link (913) and the manual valve (916).
20. Inspect the manual valve (916) for scratches or damage.

LOWER CONTROL VALVE BODY ASSEMBLY

Tools Required

J 36850 Assembly Lubricant (or equivalent)

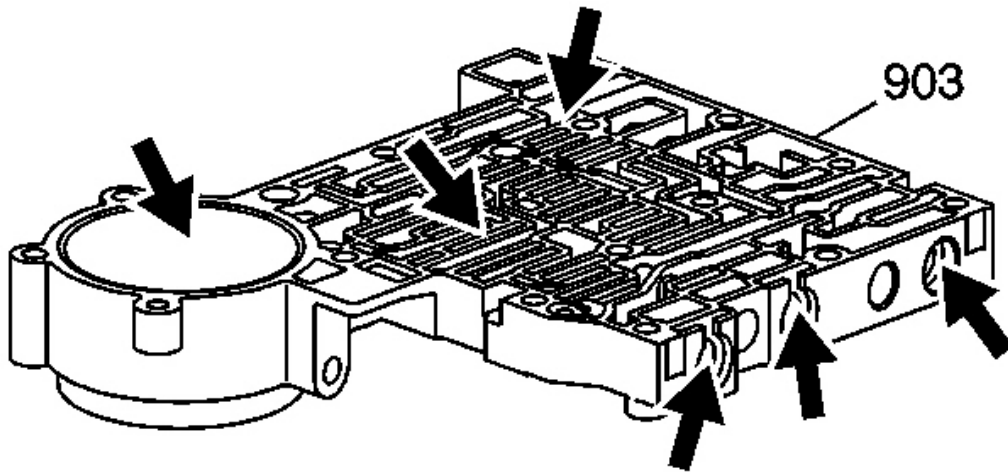


Fig. 276: Inspection Areas On Lower Control Valve Body
Courtesy of GENERAL MOTORS CORP.

1. Inspect the lower control valve body (903) for scratches or debris in the valve bores.
2. Inspect the mating surfaces for damage.
3. Inspect the servo bore for damage.
4. Inspect all fluid passages for debris.

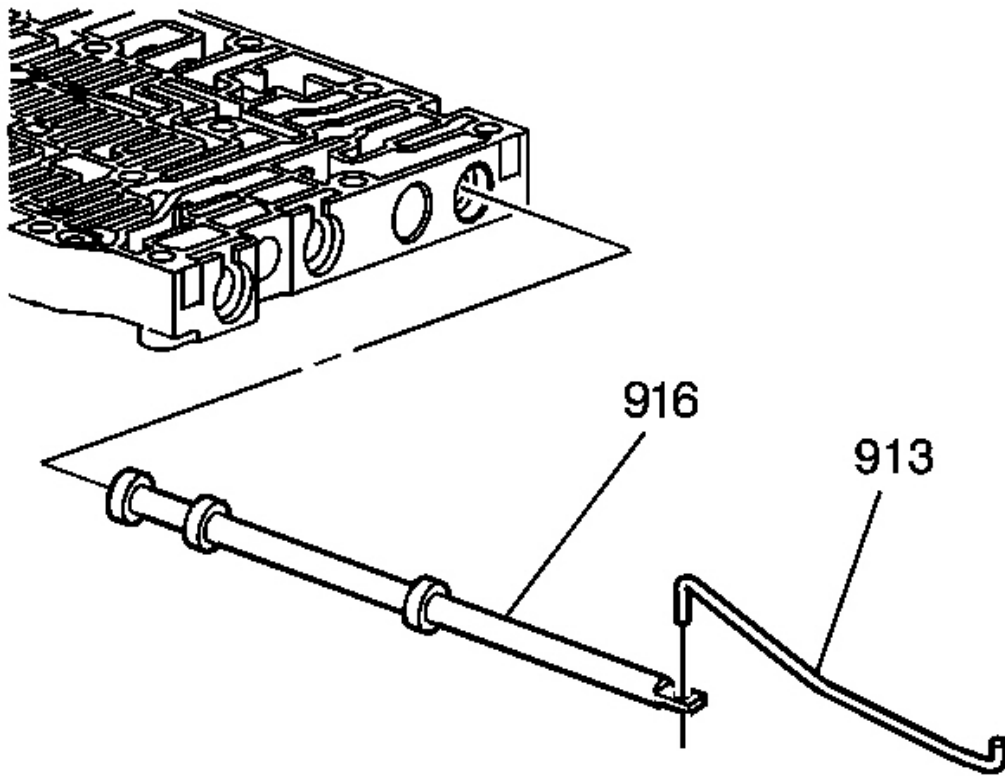


Fig. 277: Manual Valve & Link
Courtesy of GENERAL MOTORS CORP.

5. Attach the manual valve link (913) onto the manual valve (916). Install the manual valve and link assembly into the lower control valve body.

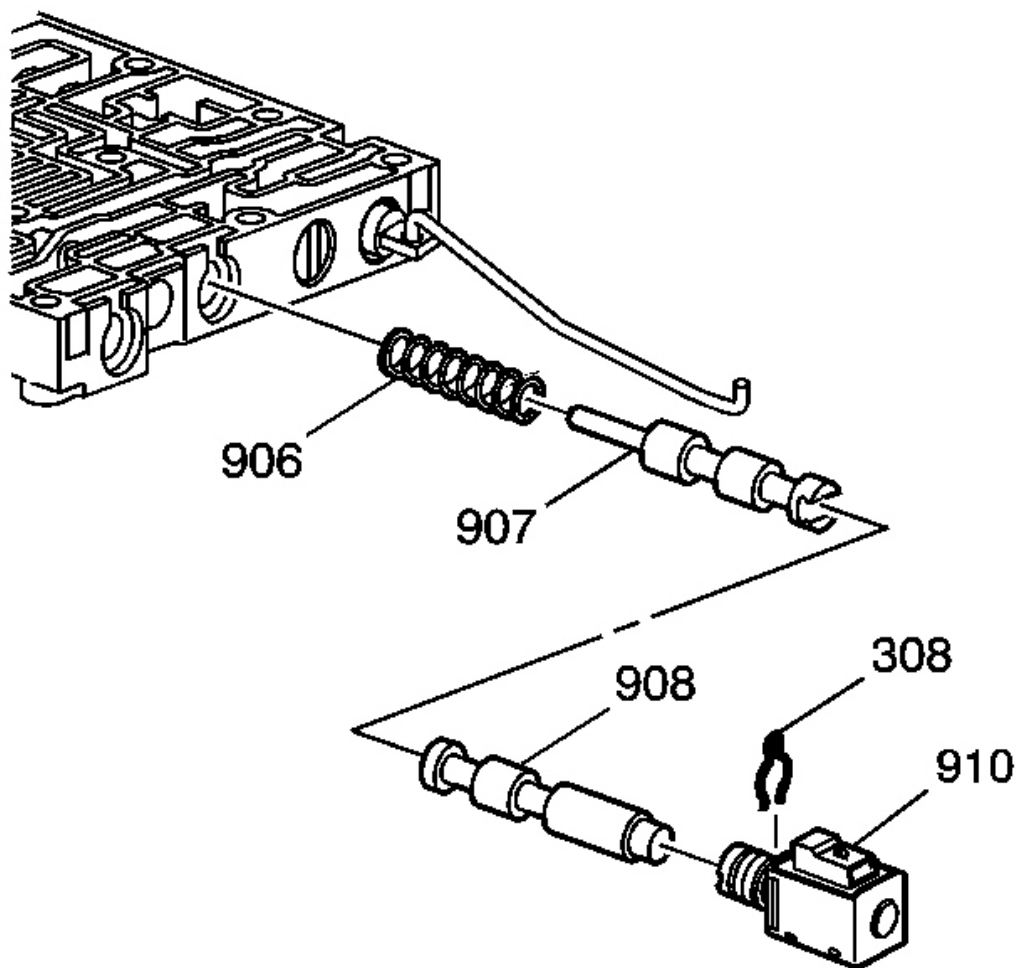


Fig. 278: 2-3 Shift Valve
Courtesy of GENERAL MOTORS CORP.

6. Install the following parts:
 1. The 2-3 shift valve spring (906)
 2. The 2-3 shift valve C (907)
 3. The 2-3 shift valve D (908)
 4. The 2-3 shift solenoid valve (910)
 5. The 2-3 shift solenoid valve retainer clip (308)

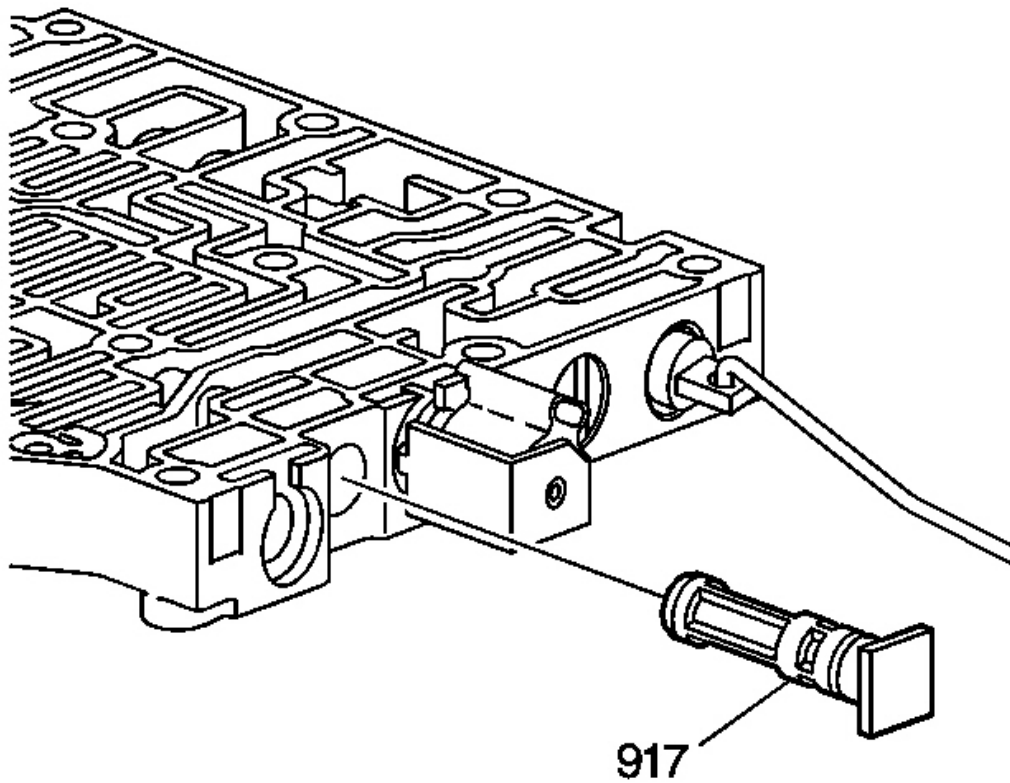


Fig. 279: Solenoid Screen Assembly
Courtesy of GENERAL MOTORS CORP.

7. Install the solenoid screen assembly (917).

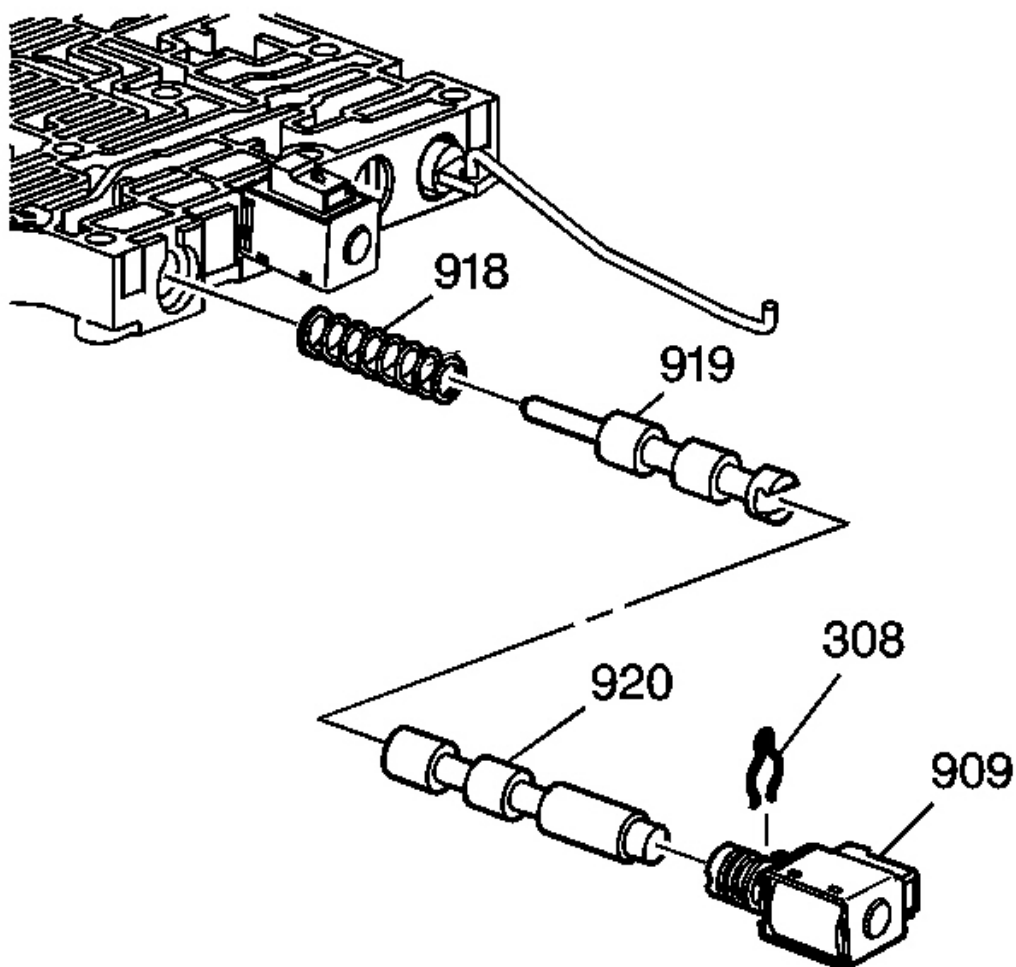


Fig. 280: 1-2 Shift Valve

Courtesy of GENERAL MOTORS CORP.

8. Install the following parts:
 1. The 1-2 shift valve spring (918)
 2. The 1-2 shift valve A (919)
 3. The 1-2 shift valve B (920)
 4. The 1-2 shift solenoid valve (909)
 5. The 1-2 shift solenoid valve retainer clip (308)

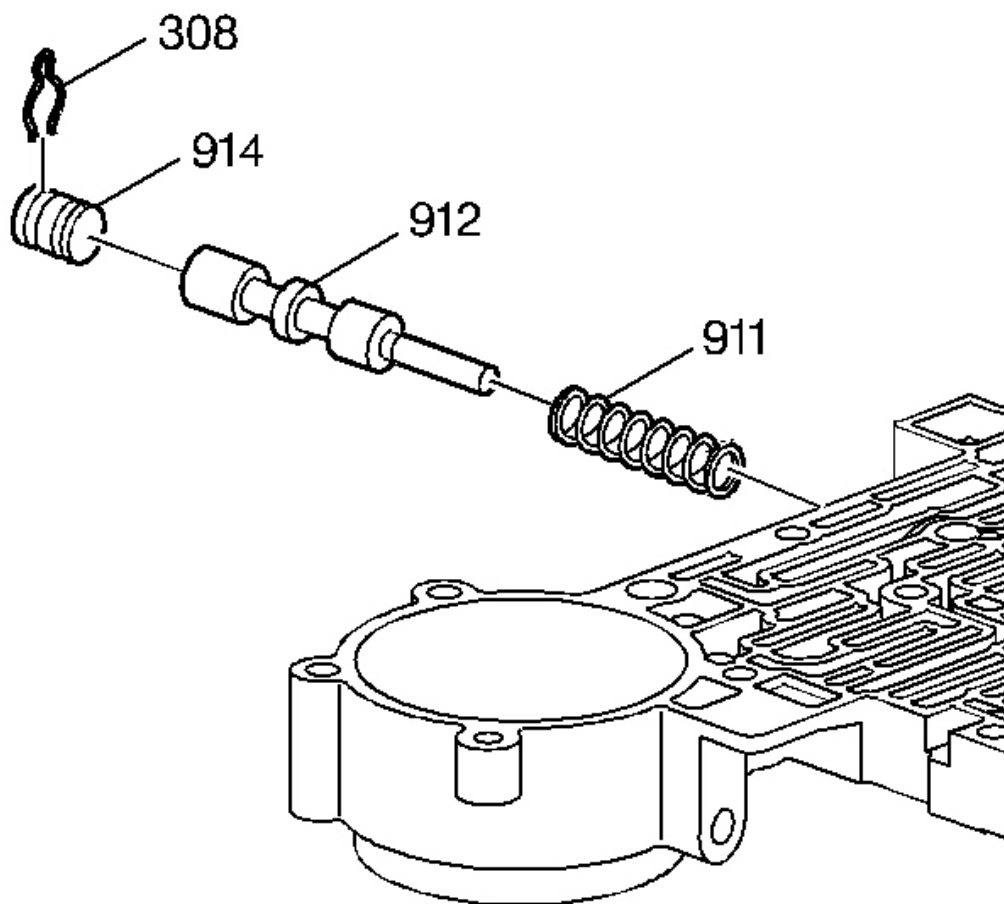


Fig. 281: Locating 3-4 Shift Valve Assembly
Courtesy of GENERAL MOTORS CORP.

9. Install the following parts:
 1. The 3-4 shift valve spring (911)
 2. The 3-4 shift valve (912)
 3. The bore plug (914)
 4. The bore plug retainer clip (308)

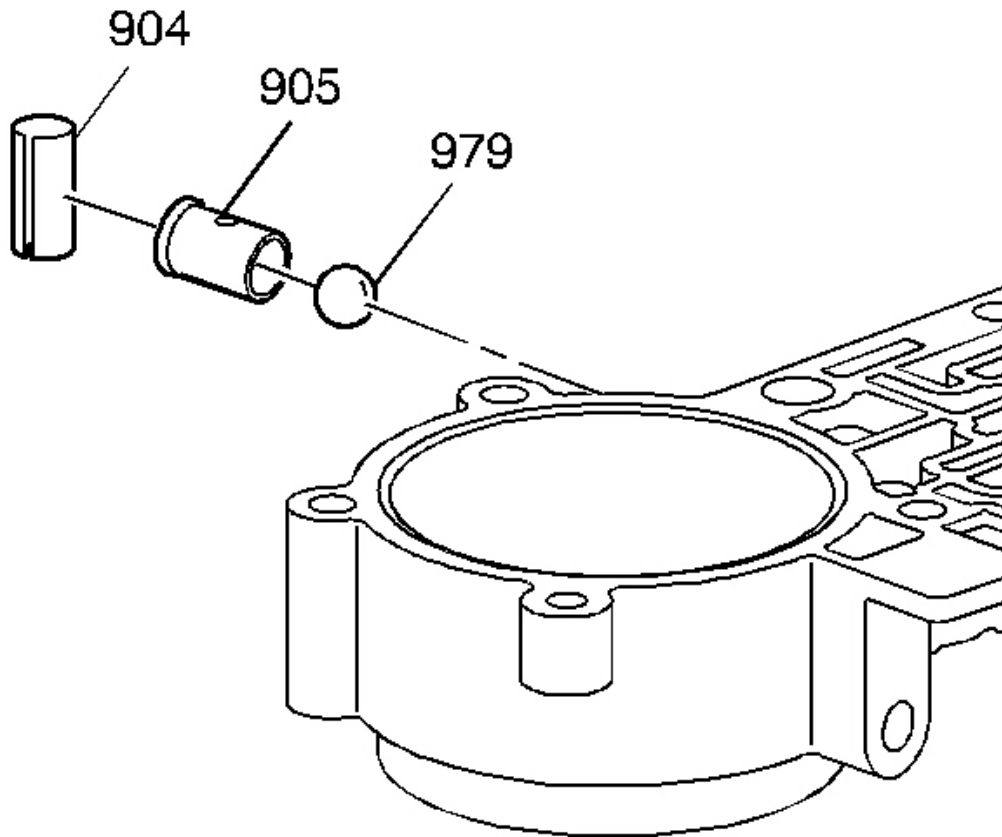


Fig. 282: Identifying Ball Check Capsule
Courtesy of GENERAL MOTORS CORP.

10. Install the following parts:
 1. The ball (979)
 2. The ball check capsule (905)
 3. The spring retainer (904)

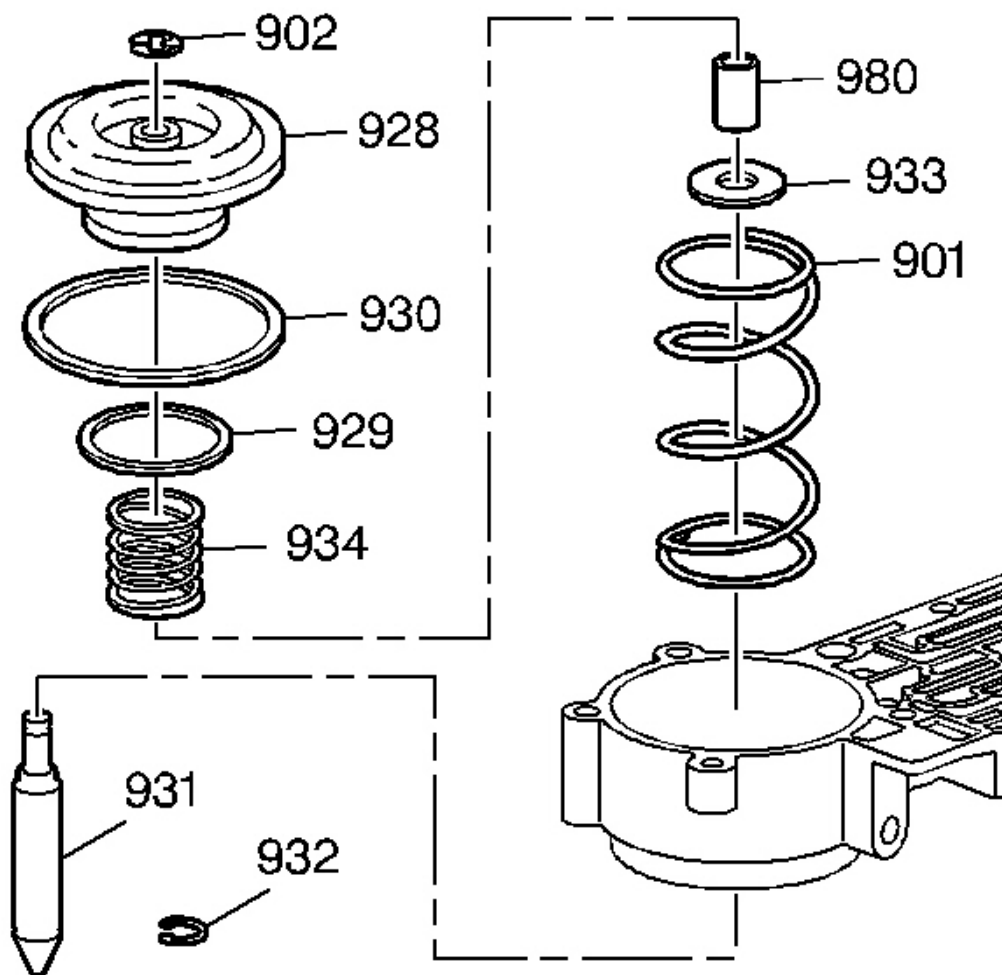


Fig. 283: View Of Low/Reverse Servo Components
Courtesy of GENERAL MOTORS CORP.

11. Install the washer (933) and the sleeve (980) onto the servo apply pin (931).
12. Install the servo cushion spring (934) into the low/reverse servo piston (928).
13. Install the servo apply pin (931) into the low/reverse piston (928).
14. Install the retaining ring (902) onto the servo apply pin (931).
15. Place the return spring (901) into the low/reverse servo bore.
16. Place new seals (929, 930) on the low/reverse servo piston (929), and install the low/reverse servo assembly into the servo bore. Attach the retaining ring (932) to the servo

apply pin (931).

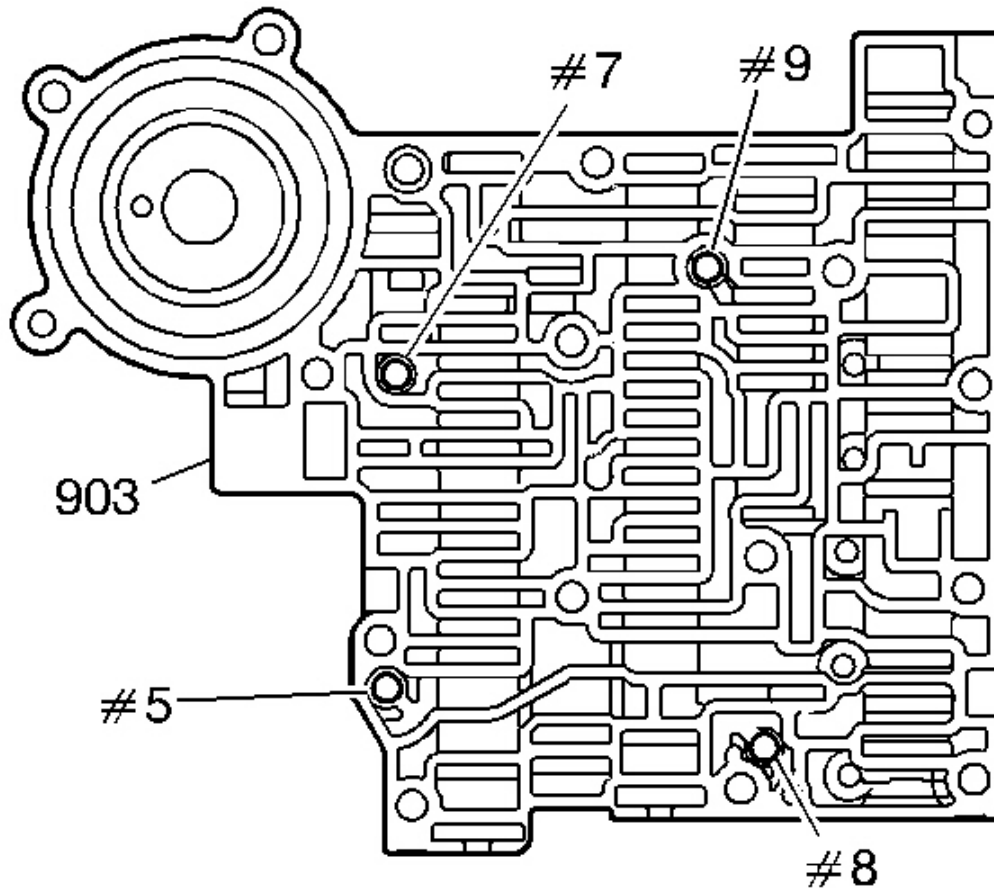


Fig. 284: View Of Checkball Cavities In Lower Control Valve Body
Courtesy of GENERAL MOTORS CORP.

17. Install the checkballs (#5, #7, #8, #9) into the lower control valve body (903). Retain the checkballs in position with **J 36850** or equivalent.

CHANNEL PLATE ASSEMBLE

Tools Required

- **J 39630-1** Guide Pins. See **Special Tools**.

- **J 39630-2** Guide Pins. See Special Tools.

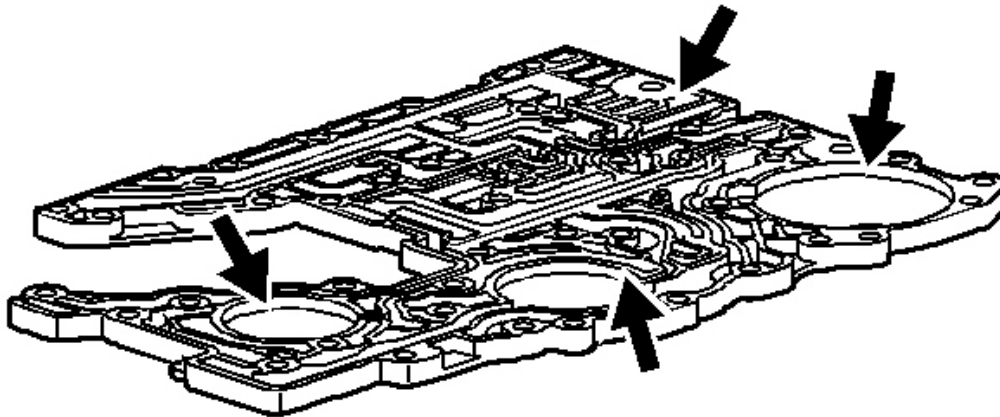


Fig. 285: Locating Lower Channel Plate Accumulator Bores & Mating Surfaces
Courtesy of GENERAL MOTORS CORP.

1. Inspect the lower channel plate accumulator bores and mating surfaces for scratches or damage.

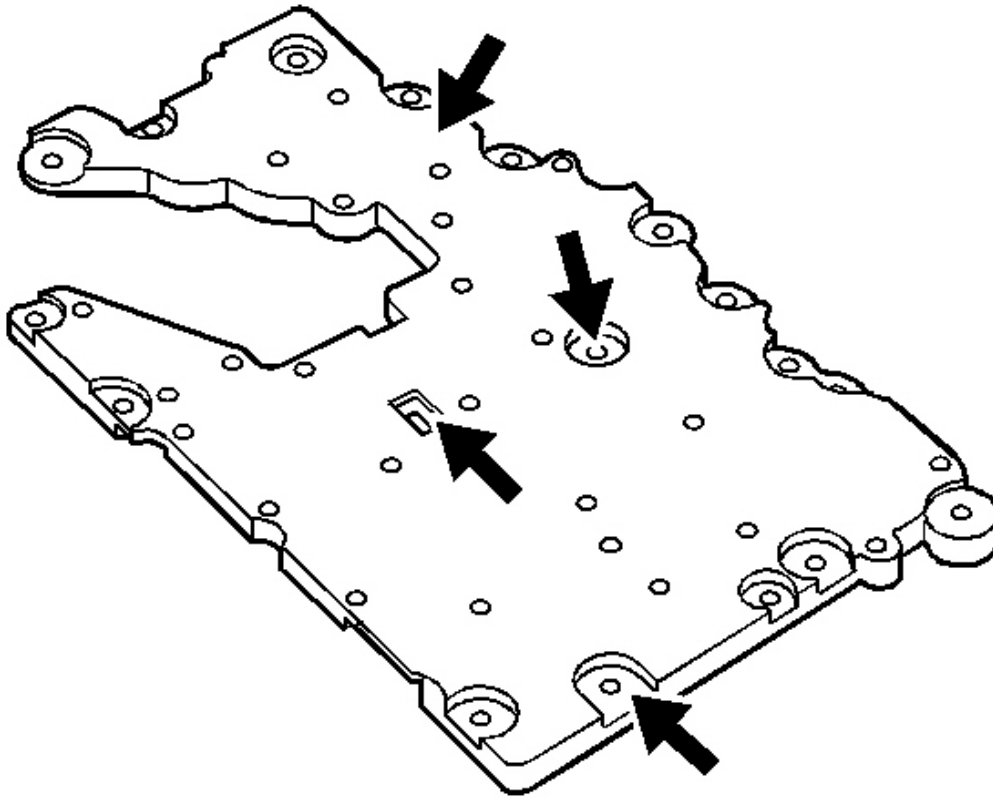


Fig. 286: Inspection Areas On Lower Channel Plate
Courtesy of GENERAL MOTORS CORP.

2. Inspect the bottom side of the lower channel plate for damage to the bolt holes or debris in passages.

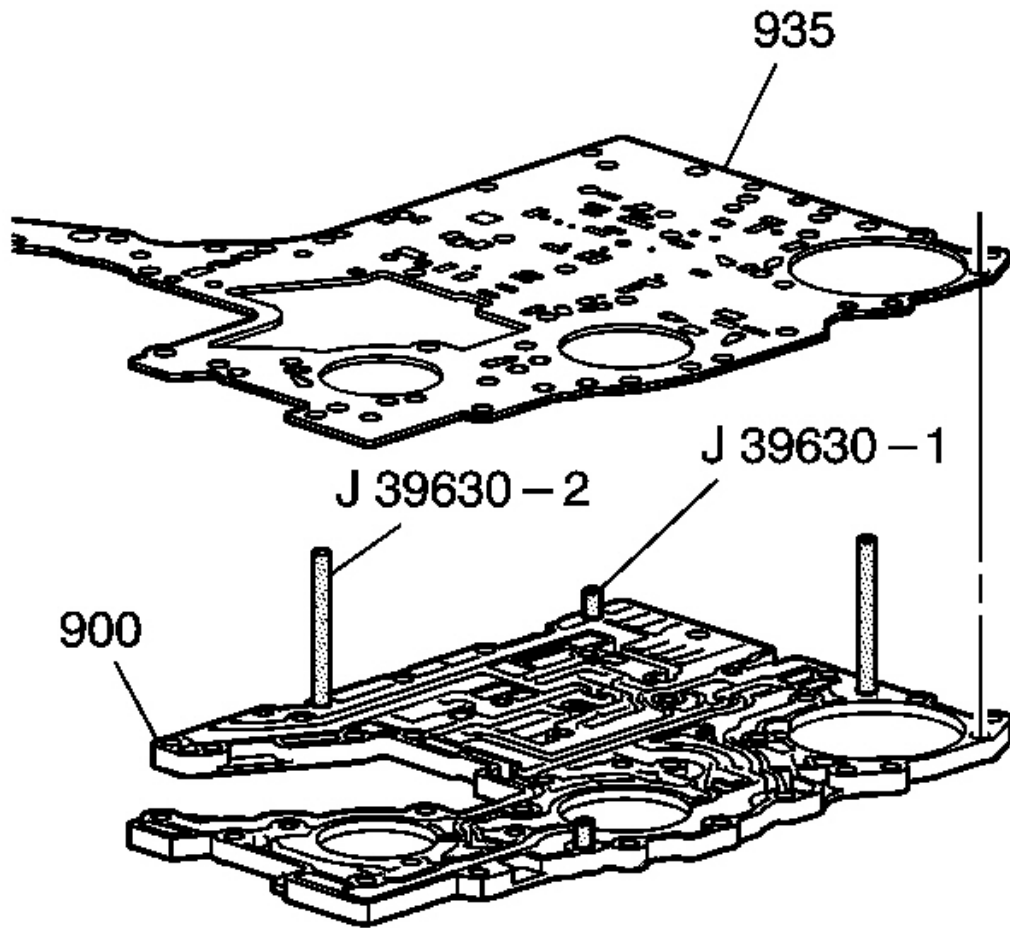


Fig. 287: Installing The Spacer Plate And Gasket Assembly (935) Onto The Lower Channel Plate Using J 39630-1 & J 39630-2
Courtesy of GENERAL MOTORS CORP.

3. Insert the **J 39630-1** into the lower channel plate (900) and rest the channel plate on the guide pin heads. See **Special Tools**.
4. Install the **J 39630-2** into the lower channel plate (900). See **Special Tools**.
5. Install the spacer plate and gasket assembly (935) onto the lower channel plate (900).

LOWER CONTROL VALVE BODY AND INTERNAL MODE SWITCH INSTALLATION

Tools Required

- **J 39630-1** Lower Control/Valve Body Gasket Guide Pins. See Special Tools.
- **J 39630-2** Lower Control/Valve Body Gasket Guide Pins. See Special Tools.
- **DT-47707-R1** Internal Mode Switch Alignment Tool. See Special Tools.

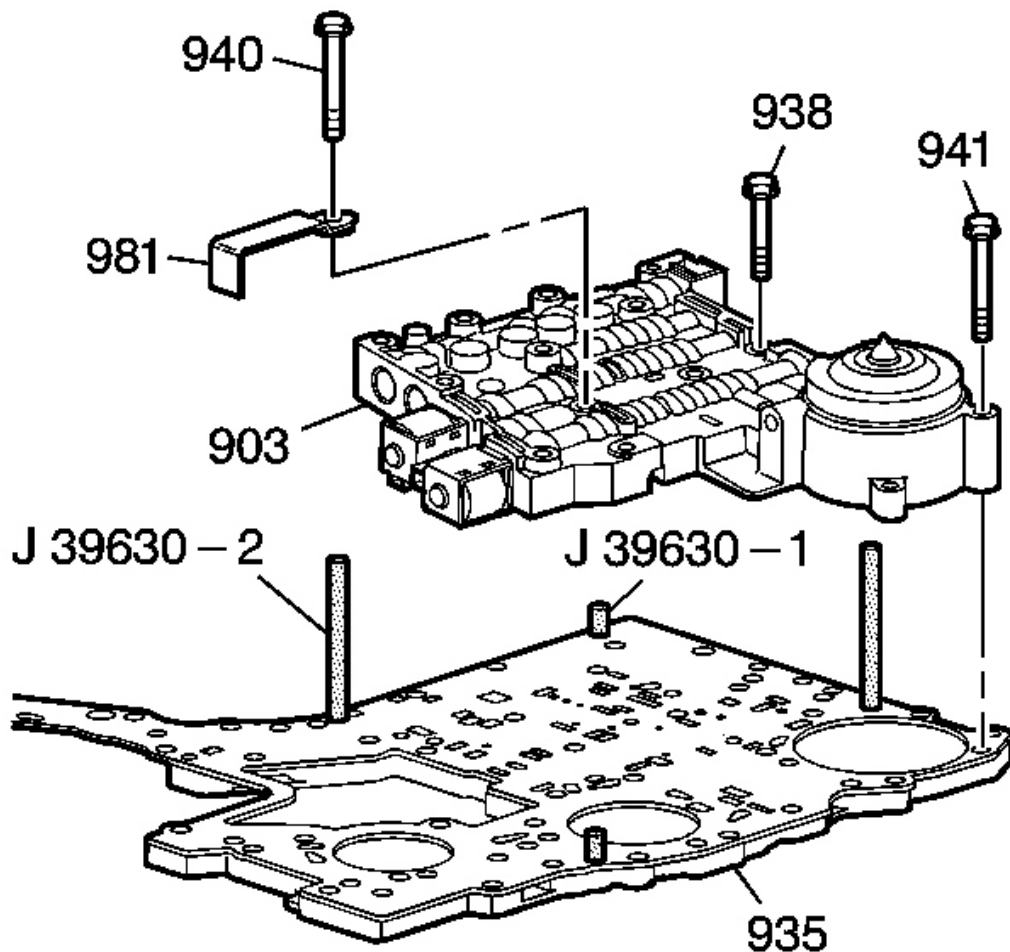


Fig. 288: Installing The Lower Control Valve Body Over J 39630-2
 Courtesy of GENERAL MOTORS CORP.

1. Install the lower control valve body (903) over the **J 39630-2** . See Special Tools.

NOTE: Refer to FASTENER NOTICE in Cautions and Notices.

2. Position the solenoid valve fluid filter retainer (981) onto the lower control valve body (903) and install some of the valve body bolts (938, 940, 941) and hand tighten them.
3. Remove the **J 39630-2** . See Special Tools.

Tighten: Tighten the bolts (938, 940, 941) in a star pattern to 8-14 N.m (6-10 lb ft).

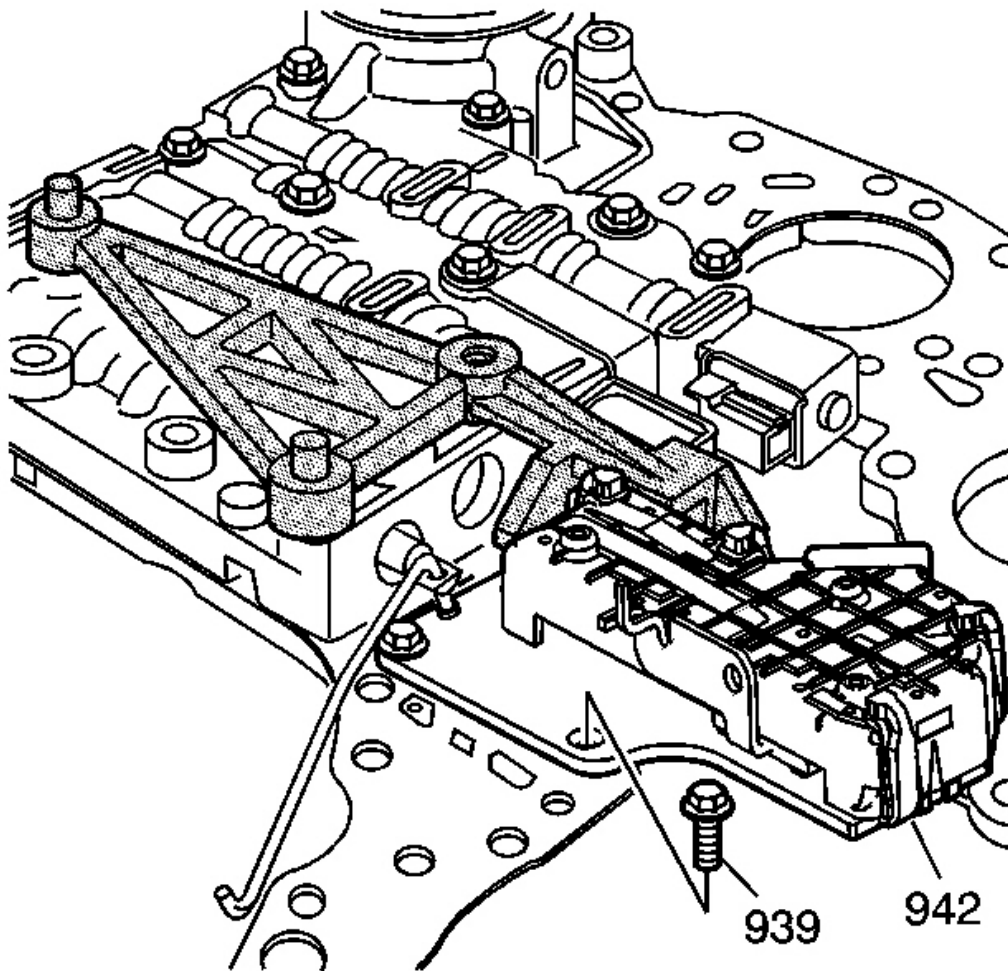


Fig. 289: DT-47707-R1
Courtesy of GENERAL MOTORS CORP.

4. Position the **DT-47707-R1** onto the lower control valve body, next to the 2-3 shift solenoid valve, and install the two **J 39630-1** . See Special Tools.

IMPORTANT: Hold the IMS (942) against the DT-47707-R1 while tightening the bolts. See Special Tools.

5. Locate the internal mode switch (IMS) (942) against the **DT-47707-R1** and install the three 8 mm bolts (939). See Special Tools.

Tighten: Tighten the bolts (939) to 8-14 N.m (6-10 lb ft).

6. Remove the **DT-47707-R1** and the **J 39630-1** . See Special Tools.

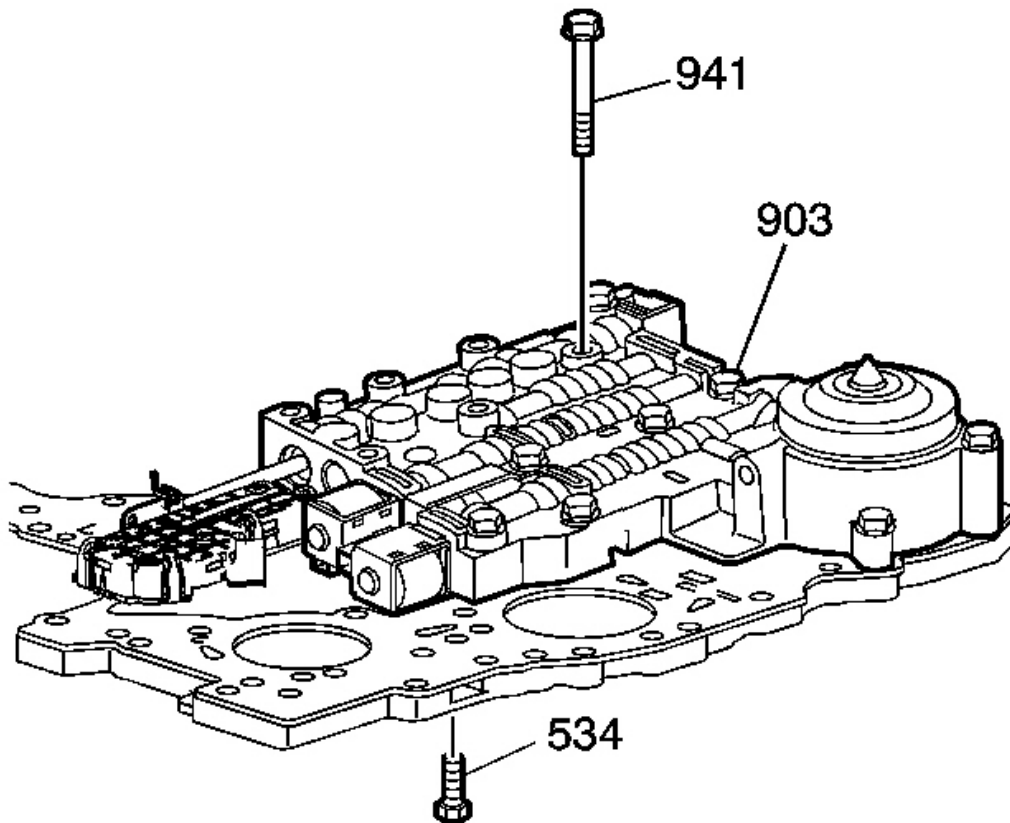


Fig. 290: Lower Control Valve Body
Courtesy of GENERAL MOTORS CORP.

7. Install the remaining bolts (941) into the lower control valve body (903).

Tighten: Tighten the bolts (941) to 8-14 N.m (6-19 lb ft).

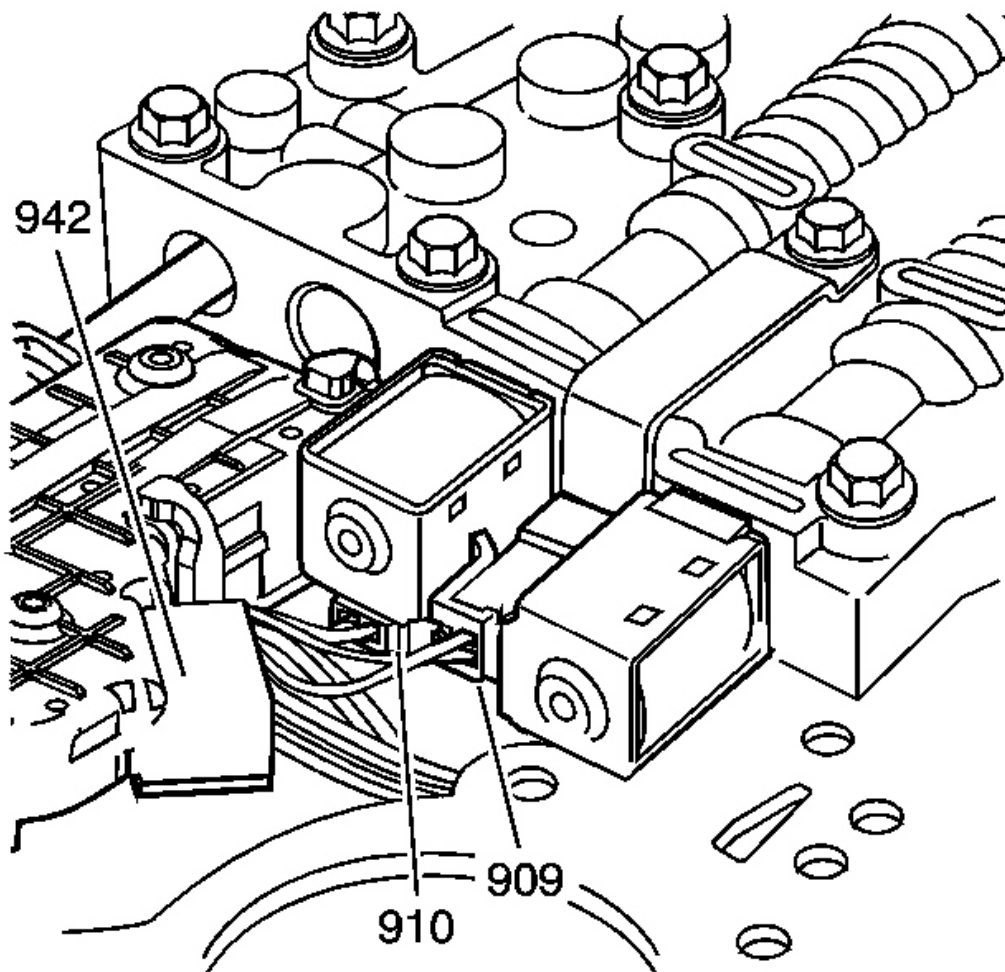


Fig. 291: Lower Control Valve Body Wire Harness
Courtesy of GENERAL MOTORS CORP.

8. Connect the lower control valve body wire harness (943) to the following parts:
 - 1-2 shift solenoid valve (909)
 - 2-3 shift solenoid valve (910)
 - Internal mode switch (IMS) (942)

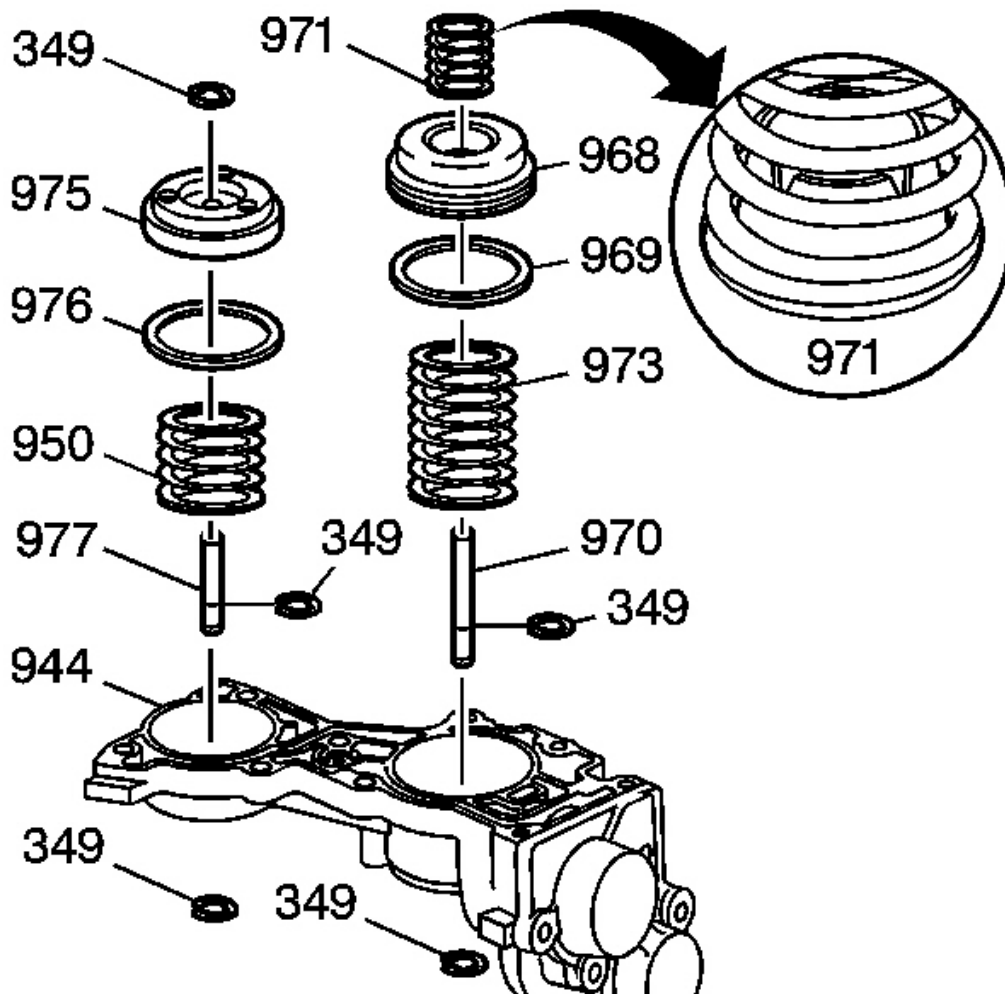


Fig. 292: Identifying 1-2 Accumulator Assembly & 3-4 Accumulator Assembly
Courtesy of GENERAL MOTORS CORP.

1. Remove the following parts:
 - The two snap rings (349) from the top side of the accumulator housing (944)
 - The 1-2 accumulator assembly (968-970, 973)
 - The 3-4 accumulator assembly (975-977, 950)
2. Inspect the accumulator pistons for scratches or damage. Inspect the accumulator piston pins for scoring.

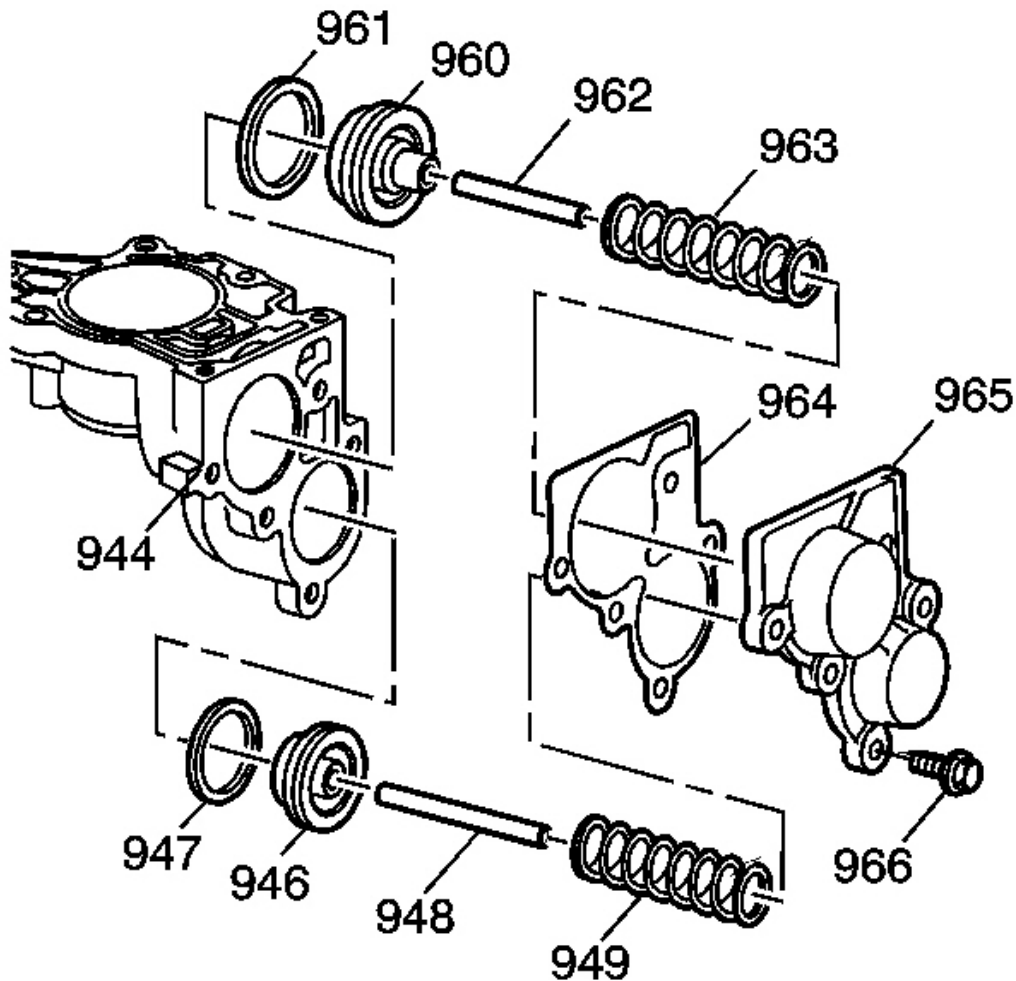


Fig. 293: View Of Forward Accumulator Assembly & Reverse Accumulator Assembly

Courtesy of GENERAL MOTORS CORP.

3. Remove the following parts:

- The five 8-mm cover bolts (966)
- The accumulator housing cover (965)
- The gasket (964)
- The forward accumulator assembly (960-963)
- The reverse accumulator assembly (946-949)

4. Inspect the accumulator pistons (946, 960) and the accumulator piston pins (948, 962) for scoring or damage.

ACCUMULATOR HOUSING ASSEMBLY

Tools Required

- **J 39630-2** Lower Control/Valve Body Gasket Guide Pins. See **Special Tools**.
- **J 36850** Assembly Lubricant (or equivalent)

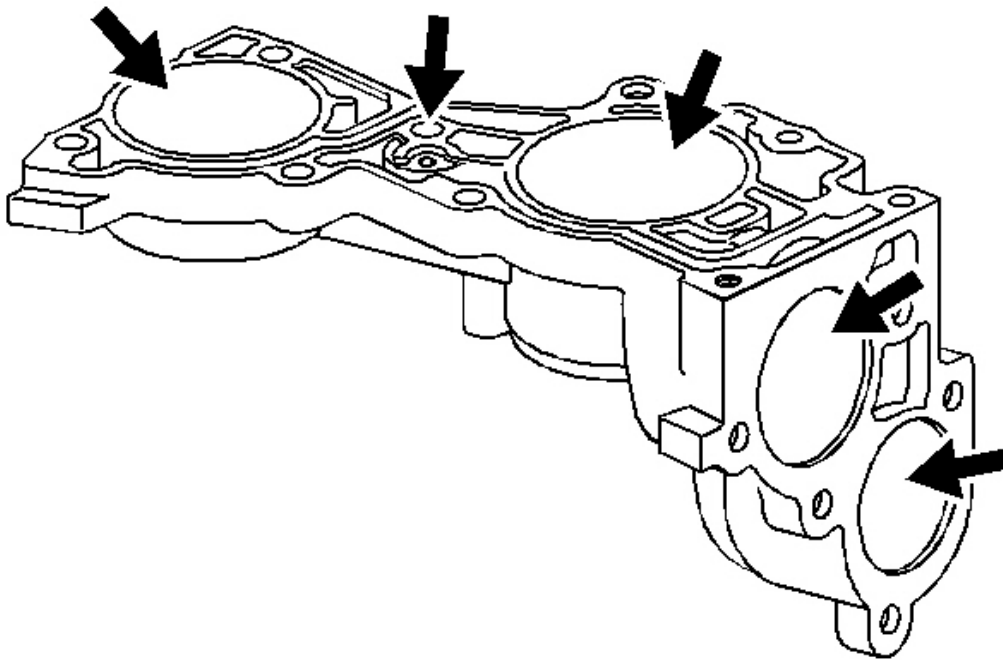


Fig. 294: Identifying Inspection Points On Accumulator Housing
Courtesy of GENERAL MOTORS CORP.

1. Inspect the accumulator housing for damage or scoring in the bores.
2. Inspect all fluid passages for debris.

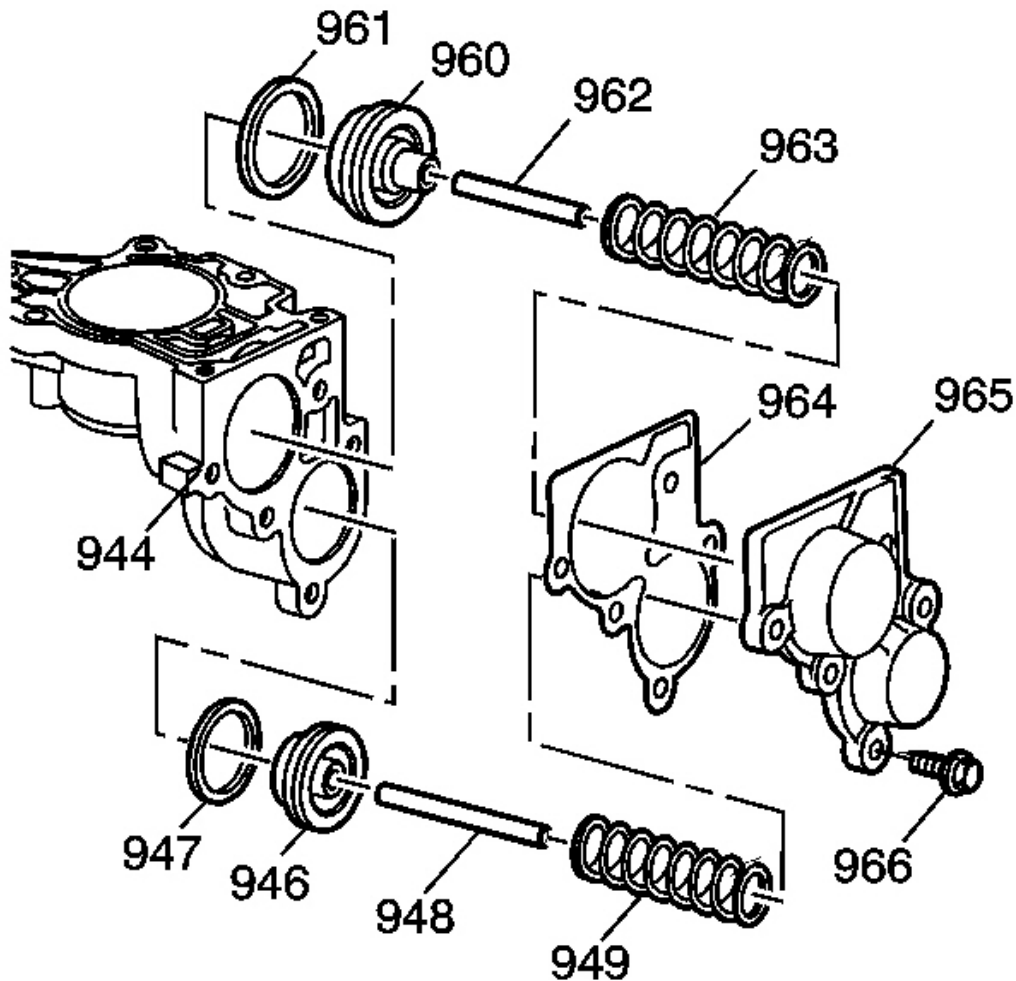


Fig. 295: View Of Forward Accumulator Assembly & Reverse Accumulator Assembly

Courtesy of GENERAL MOTORS CORP.

3. Install new seals (947, 961) onto the accumulator pistons (946, 960).
4. Install the following parts:
 1. The forward accumulator pin (962) into the accumulator housing (944)
 2. The forward accumulator piston (960)
 3. The spring (963)
5. Install the following parts:

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

1. The reverse accumulator pin (948)
2. The reverse accumulator piston (946)
3. The reverse accumulator spring (949)
6. Install the following parts:
 1. The accumulator housing cover gasket (964)
 2. The accumulator housing cover (965)

NOTE: Refer to **FASTENER NOTICE** in Cautions and Notices.

3. The five 8 mm accumulator housing cover bolts (966)

Tighten: Tighten the bolts to 8-14 N.m (6-10 lb ft).

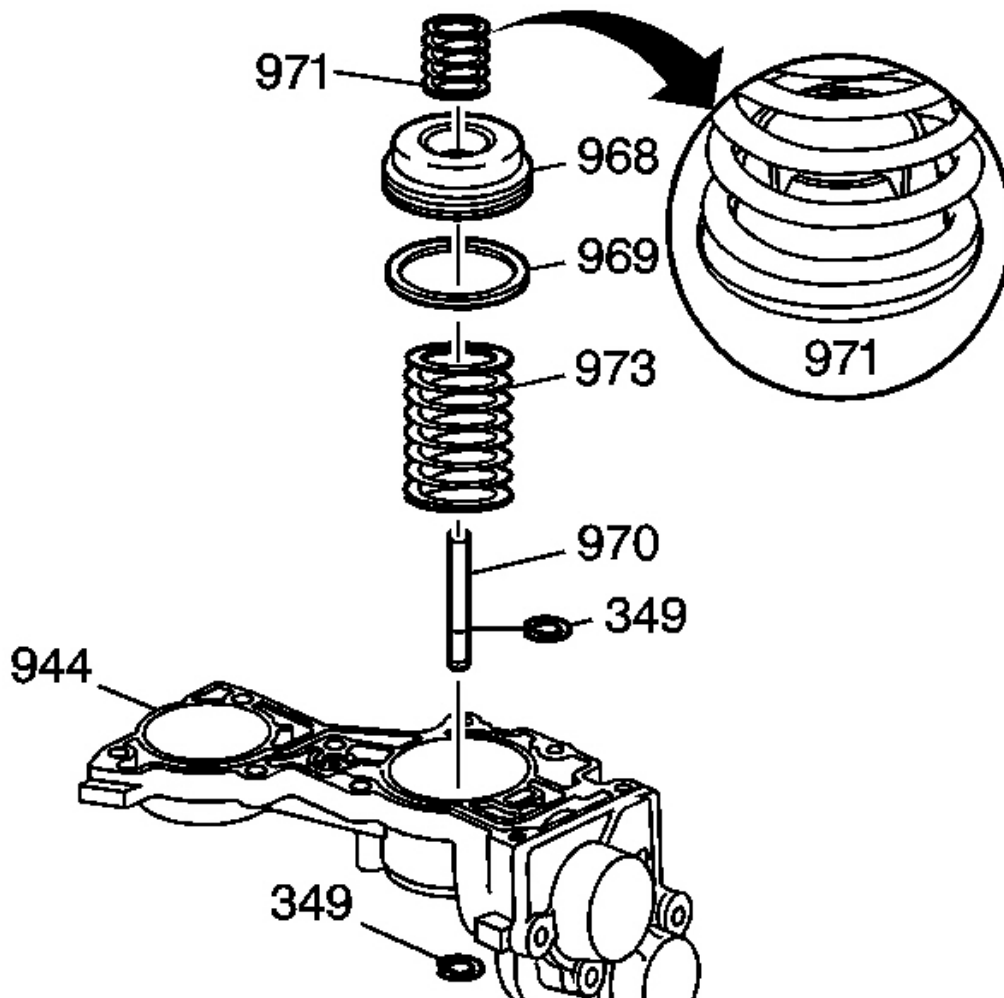


Fig. 296: Expanded View Of 1-2 Accumulator Assembly
Courtesy of GENERAL MOTORS CORP.

7. Install a new seal (969) onto the 1-2 accumulator piston (968).
8. Install the following parts:
 - The 1-2 accumulator spring (973)
 - The 1-2 accumulator pin (970)
 - The 1-2 accumulator piston (968)
 - The snap ring (349). Install the snap ring onto the 1-2 accumulator pin (970) after you

have passed the pin through the top of the accumulator housing (944).

- The 1-2 accumulator inner spring assembly (971)

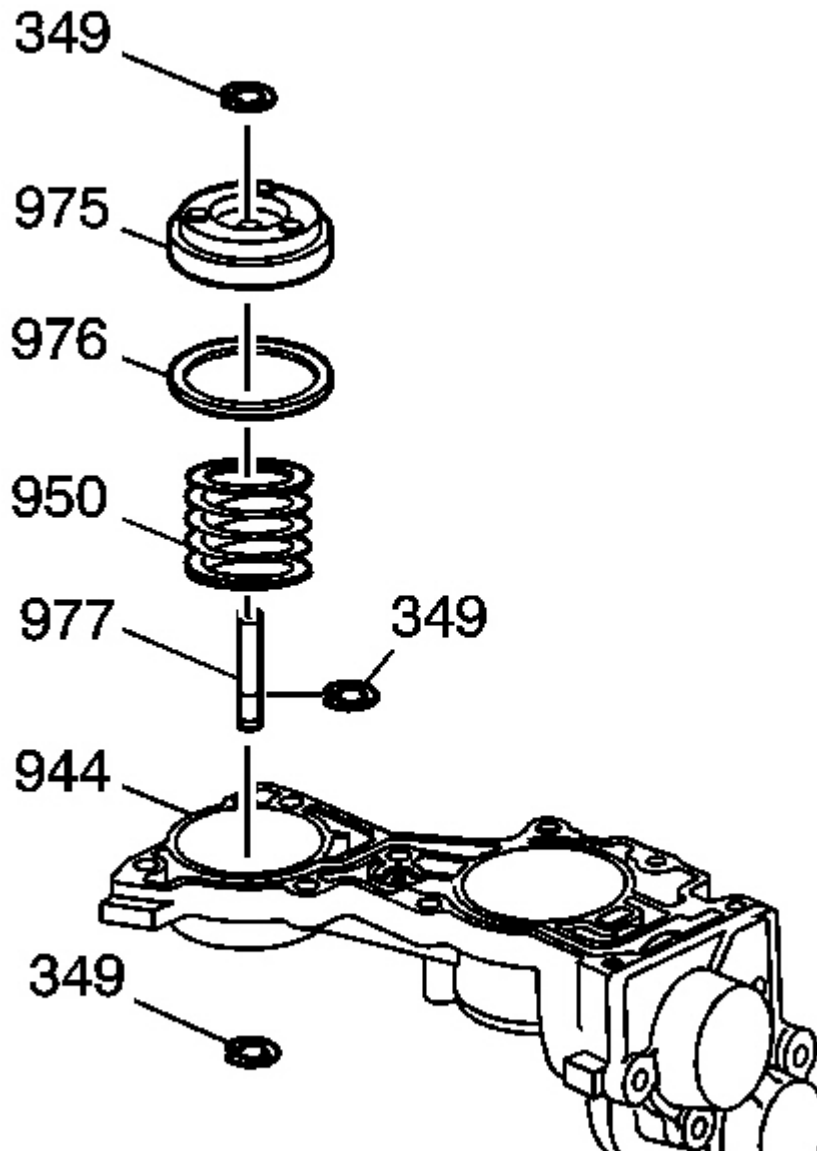


Fig. 297: Installing 3-4 Accumulator Housing Components
Courtesy of GENERAL MOTORS CORP.

2006 Buick Lucerne CXS
2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

9. Install the following parts:

- The 3-4 accumulator spring (950)
- The 3-4 accumulator pin (977)
- The 3-4 accumulator piston (975)
- The snap ring (349). Install the snap ring onto the 3-4 accumulator pin (977) after you have passed the pin through the top of the accumulator housing (944).

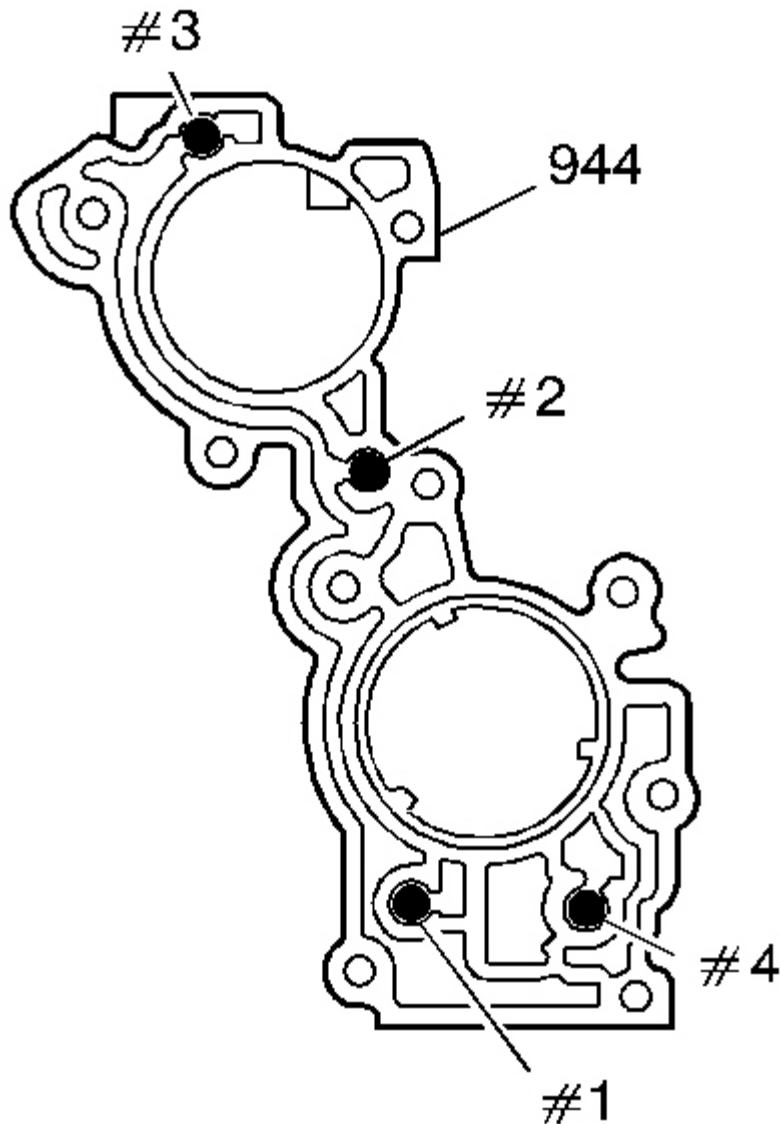


Fig. 298: Identifying Checkball Cavities
Courtesy of GENERAL MOTORS CORP.

10. Install the checkballs (#1-4) into their proper cavities in the accumulator housing (944). Retain the checkballs with **J 36850** or equivalent.

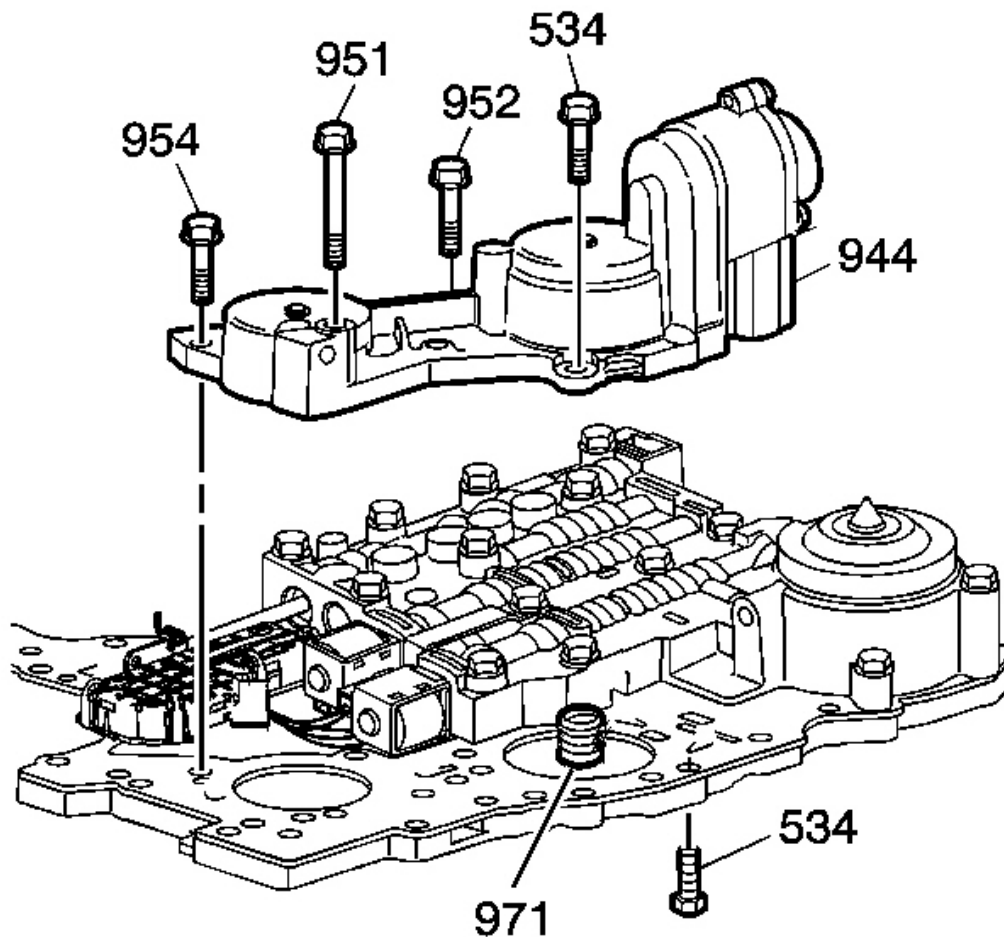


Fig. 299: Accumulator Housing
 Courtesy of GENERAL MOTORS CORP.

11. Install the **J 39630-2** into the lower control valve body gasket for the accumulator housing. See **Special Tools**. Make sure that the 1-2 accumulator inner spring assembly (971) goes into the channel plate washer side down.
12. Install the accumulator housing (944) onto the lower channel plate and install the bolts (534, 951, 952, 954) and hand tighten.
13. Remove the **J 39630-2** and install the rest of the accumulator housing bolts, including bolts (534) from the channel plate side. See **Special Tools**.

Tighten: Tighten the bolts (534, 951, 952, 954) in a star pattern to 8-14 N.m (6-10 lb ft).

LOWER CONTROLS ASSEMBLY INSTALLATION

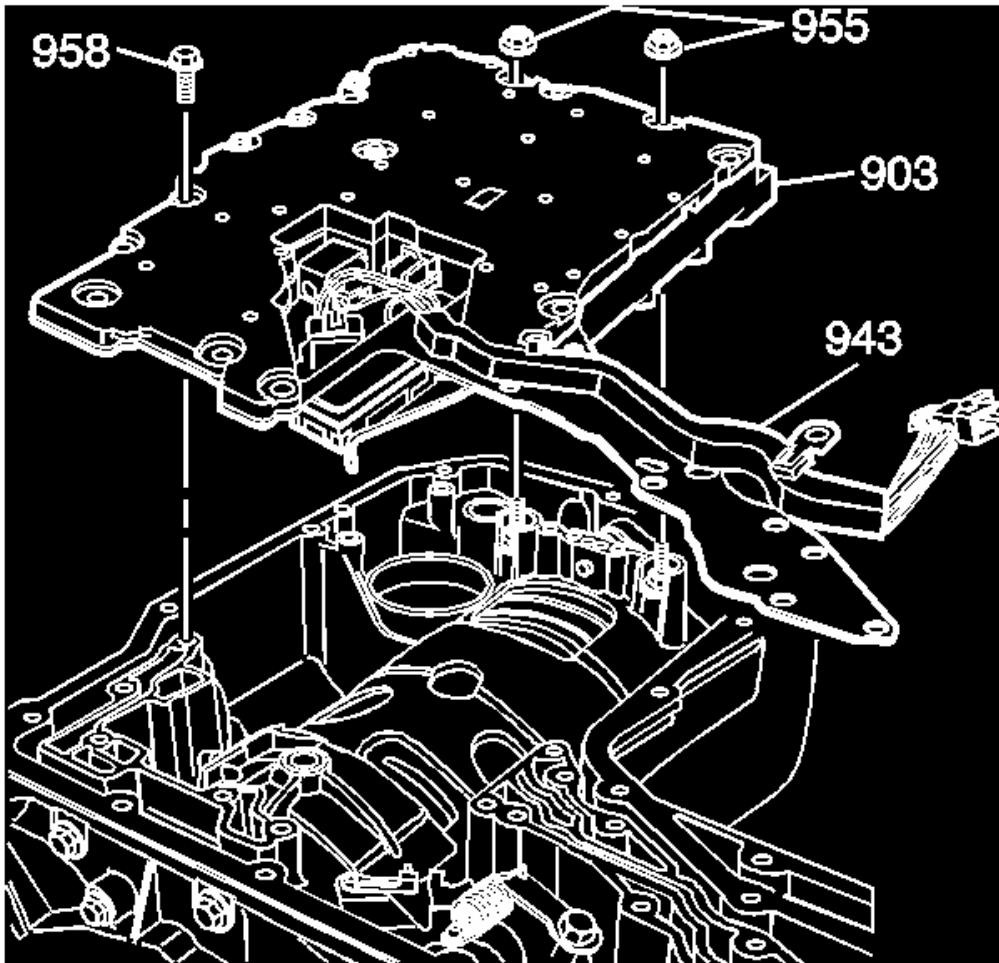


Fig. 300: Identifying Lower Channel Plate, Control Valve Body And Accumulator Assembly, And Lower Control Valve Body Wire Harness Extension
Courtesy of GENERAL MOTORS CORP.

1. Place the lower controls assembly over the forward support studs.

IMPORTANT: The bolts (958) without the flange are located next to the oil

transfer plate.

2. Hand start the bolts (534, 958) into the channel plate.
3. Install the two nuts (955) on the forward support studs.

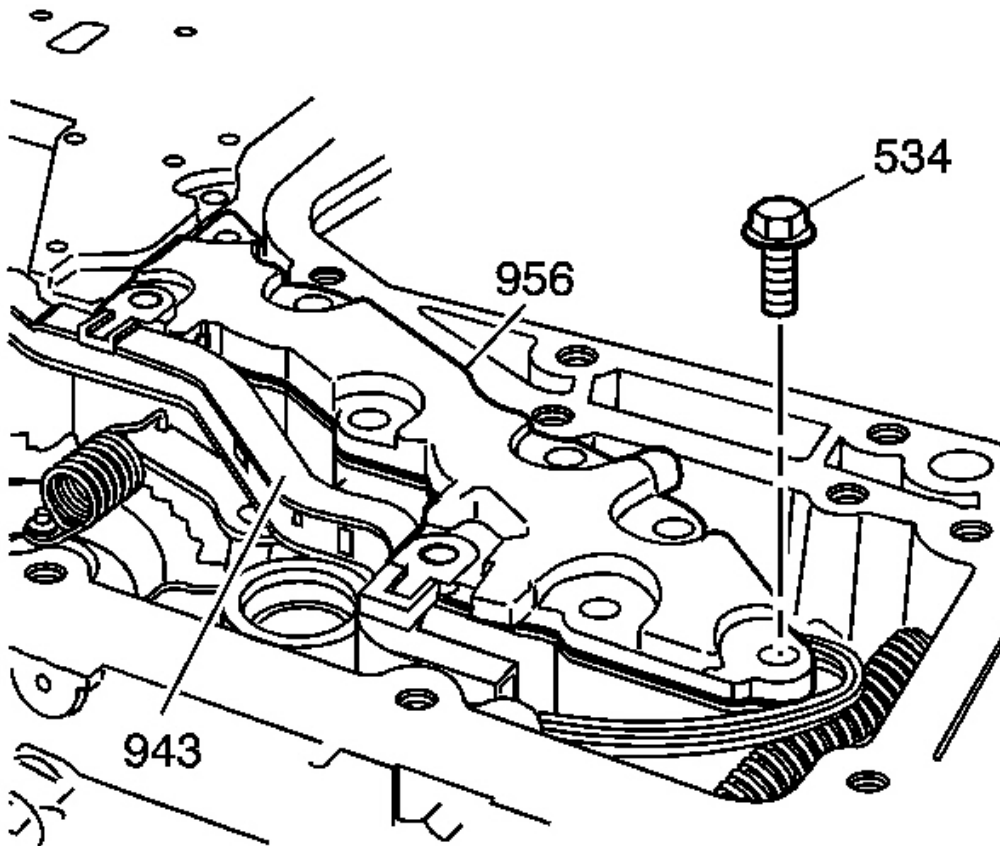


Fig. 301: Identifying Oil Transfer Plate Bolts
Courtesy of GENERAL MOTORS CORP.

4. Place the oil transfer plate (956) over the open gasket area.
5. Position the lower control valve body wire harness retaining clips (943).

NOTE: Refer to **FASTENER NOTICE** in Cautions and Notices.

6. Hand start the bolts (534) to hold the oil transfer plate (956) in place with the lower control valve body wire harness retaining clips (943) attached properly.

Tighten: Tighten the bolts and nuts (534) to 8-14 N.m (6-10 lb ft).

MANUAL LINK AND WIRE HARNESS CONNECTION

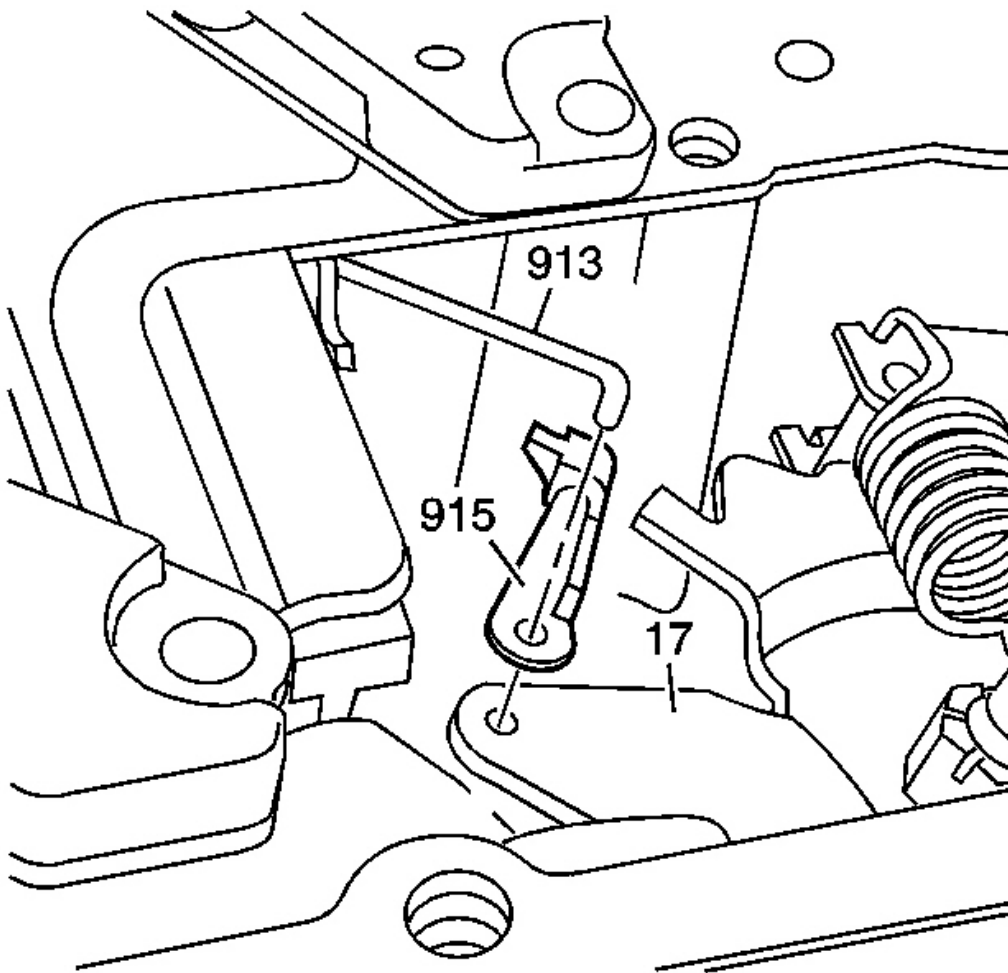


Fig. 302: Locating Manual Valve Link & Detent Lever
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Failure to use a new manual valve link retainer may cause

the manual valve link assembly to become disconnected.

1. Install a new manual valve link retainer (915) onto the detent lever (17).
2. Connect the manual valve link (913) to the detent lever (17).

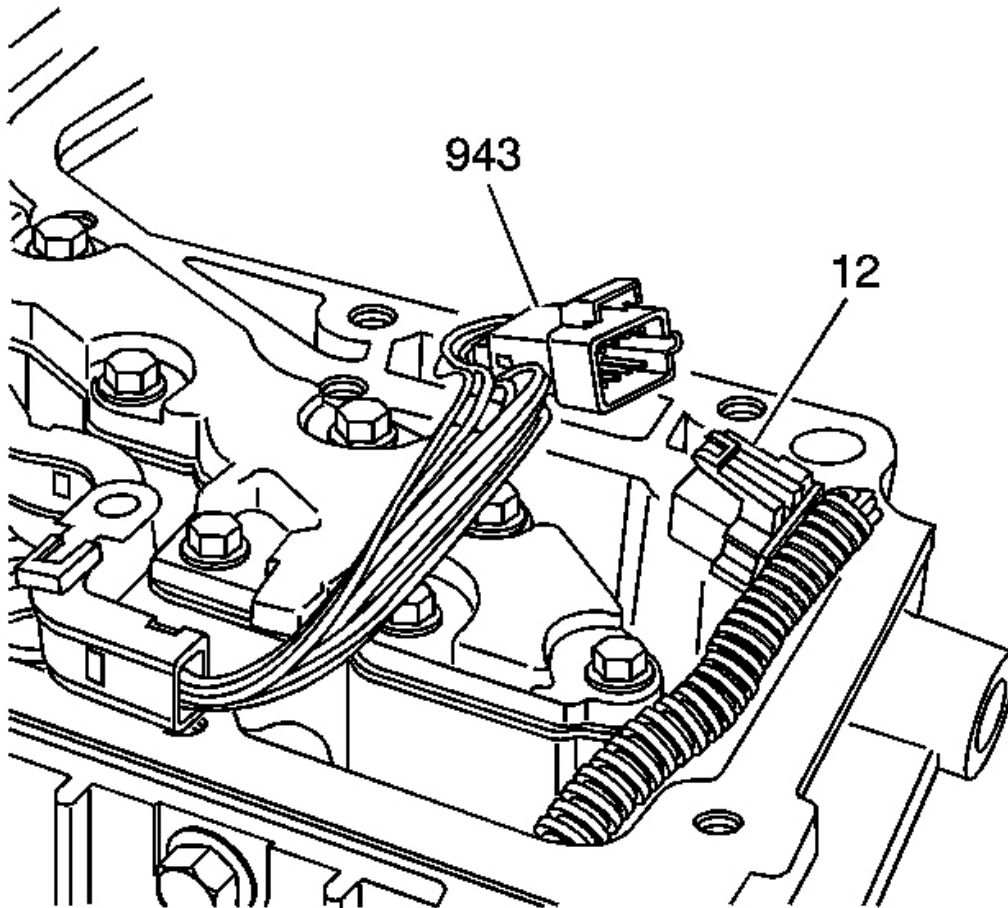


Fig. 303: View Of Wire Harness Extension & Upper Control Wire Harness
Courtesy of GENERAL MOTORS CORP.

3. Connect the wire harness extension (943) to the upper control wire harness (12).
4. Tuck the harness and connectors into the case cavity.

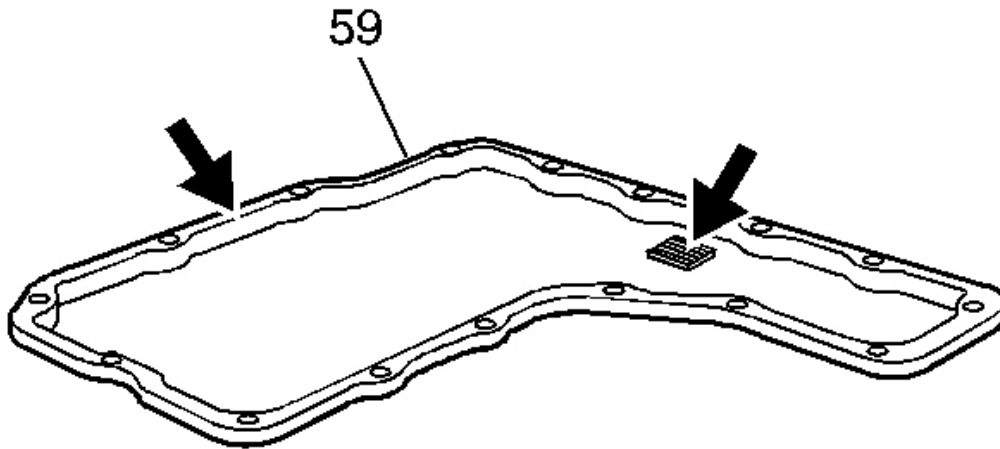


Fig. 304: Locating Inspection Areas On Sealing Surface & Bottom Pan Magnet
Courtesy of GENERAL MOTORS CORP.

1. Inspect the bottom pan (59) sealing surface for damage and inspect the bottom pan magnet for excessive metal filings. Clean if necessary.

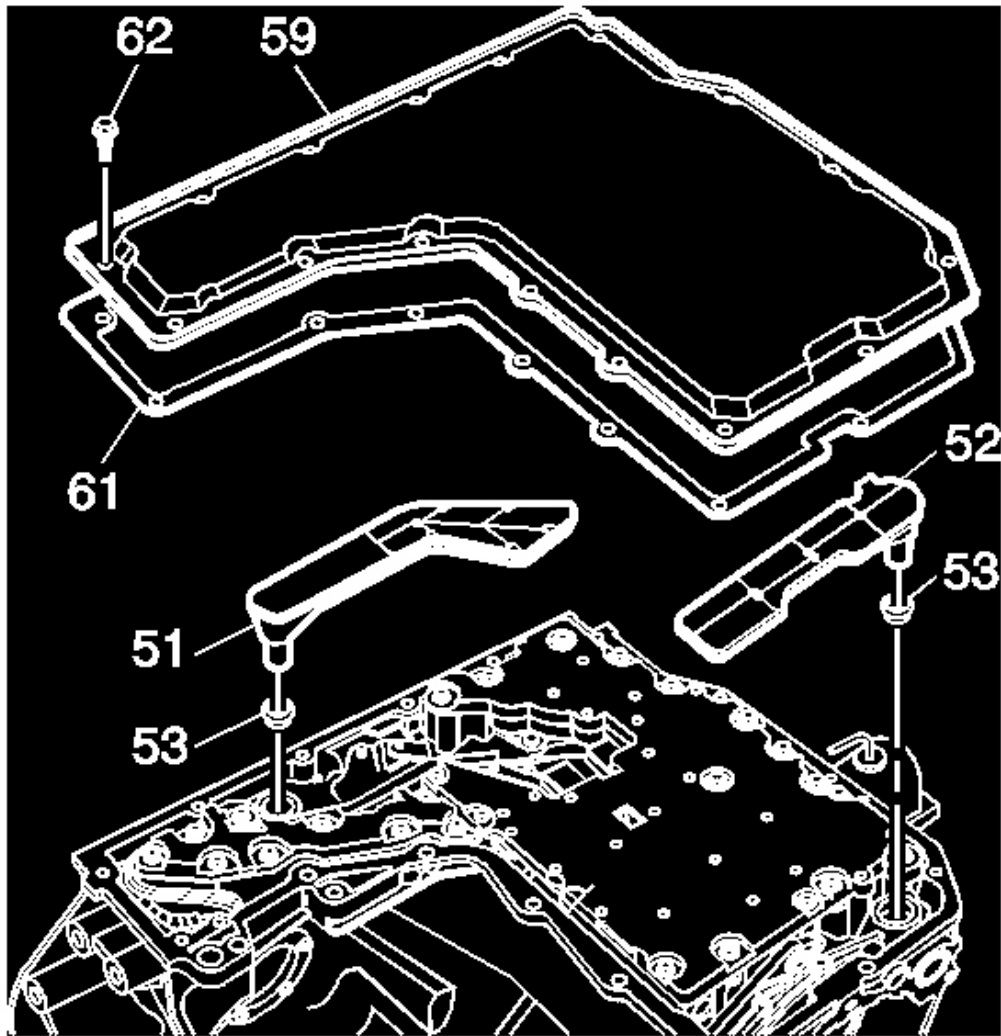


Fig. 305: View Of Bottom Pan, Scavenge Screens & Gasket
Courtesy of GENERAL MOTORS CORP.

2. Install the scavenge screen seals (53) into the case (6) and install the new scavenge screens (51, 52) into the seals.
3. Remove any residual oil from the gasket surface of the case (6), from the bottom pan (59) and from the bolts (62).

NOTE: Completely dry all bottom pan bolts (62) before installation or

fluid leaks may occur.

4. The bottom pan bolt threads in the case must be completely free of transmission fluid. Use a rubber tipped air hose to dry, if necessary.
5. Install the new gasket (61) and install the bottom pan (59).

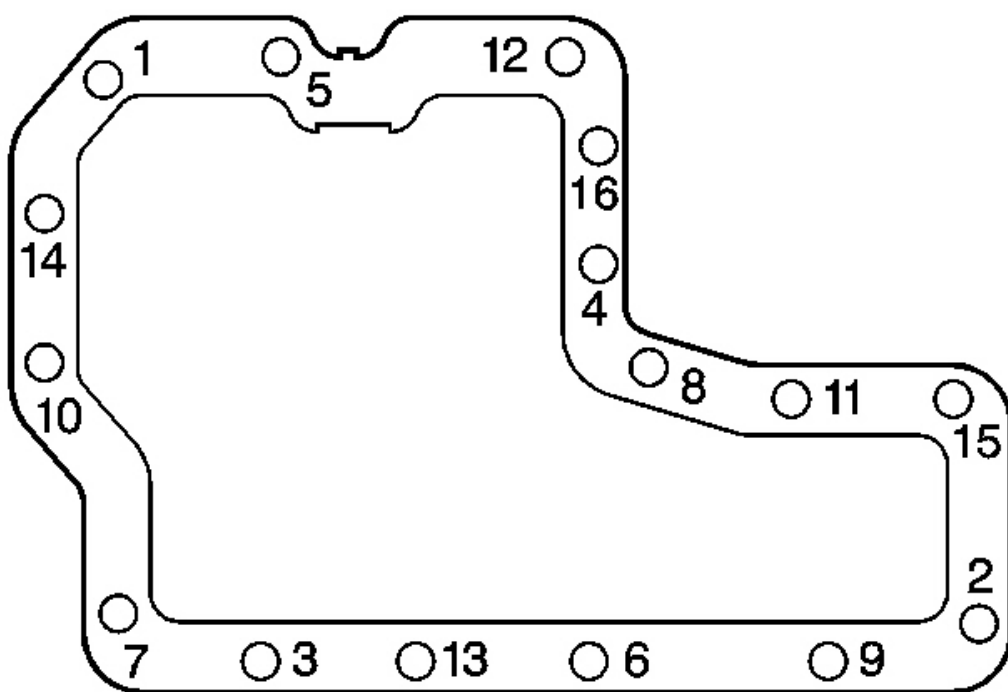


Fig. 306: View of Pan Bolts Sequence
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to **FASTENER NOTICE** in Cautions and Notices.

6. Hand start the bottom pan bolts (62) and then tighten in the sequence pattern shown.

Tighten:

1. Tighten the bolts first to 3 N.m (26.5 lb in).
2. Then tighten the bolts to 6 N.m (53.1 lb in).
3. Finally tighten the bolts to 10-12 N.m (8-9 lb ft).

FINAL DRIVE CARRIER INSPECT

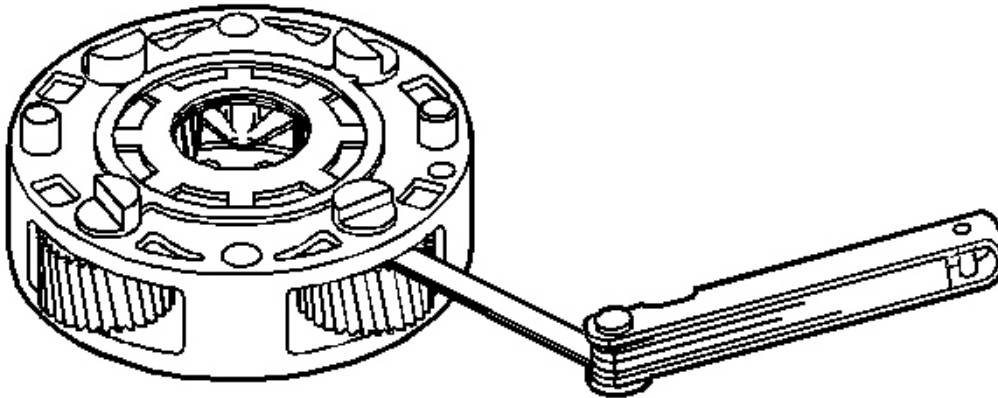


Fig. 307: Checking Final Drive Planet Pinion To Carrier Clearance
Courtesy of GENERAL MOTORS CORP.

1. Inspect the pinion gear teeth for chips or damage.

IMPORTANT: The final drive carrier (100) must be replaced if the gears are out of specification.

2. Inspect the final drive planet pinion to carrier clearance.

Specification: The final drive planet pinion to carrier clearance should be 0.20-0.30 mm (0.008-0.012 in).

DIFFERENTIAL CARRIER OVERHAUL

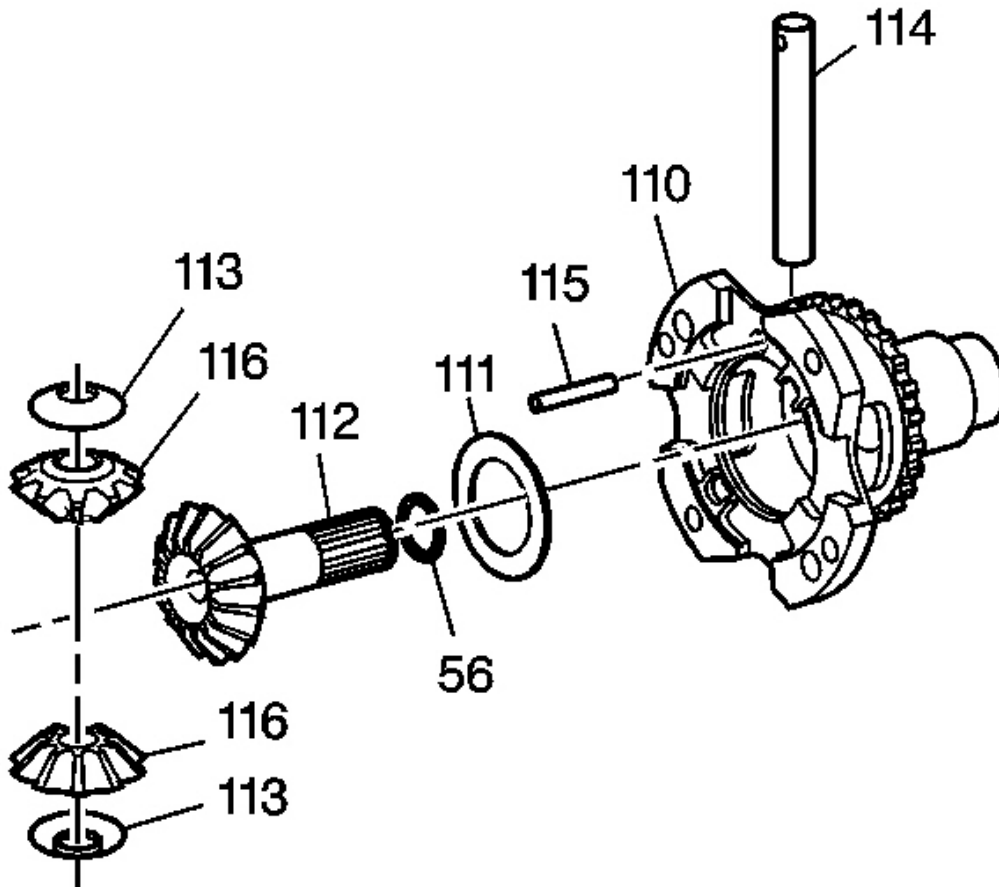


Fig. 308: View Of Differential Carrier Components
Courtesy of GENERAL MOTORS CORP.

1. Use a pin punch to drive out the differential pinion shaft retaining pin (115). Remove the following parts:
 - The differential pinion shaft (114)
 - The two pinion gears (116)
 - The two pinion thrust washers (113)
2. Remove the right differential side gear and output shaft (112). Remove the differential thrust washer (111).
3. Inspect the gears and the thrust washers for burrs or damage.

2006 Buick Lucerne CXS
2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

4. Install the following parts:

- The differential thrust washer (111)
- The right differential side gear and output shaft (112)
- The output shaft snap ring (56)
- The two pinion thrust washers (113)

The two pinion gears (116)

5. Install the differential pinion shaft (114).

6. Install the differential pinion shaft retaining pin (115).

FINAL DRIVE CARRIER/DIFFERENTIAL CARRIER INSTALL

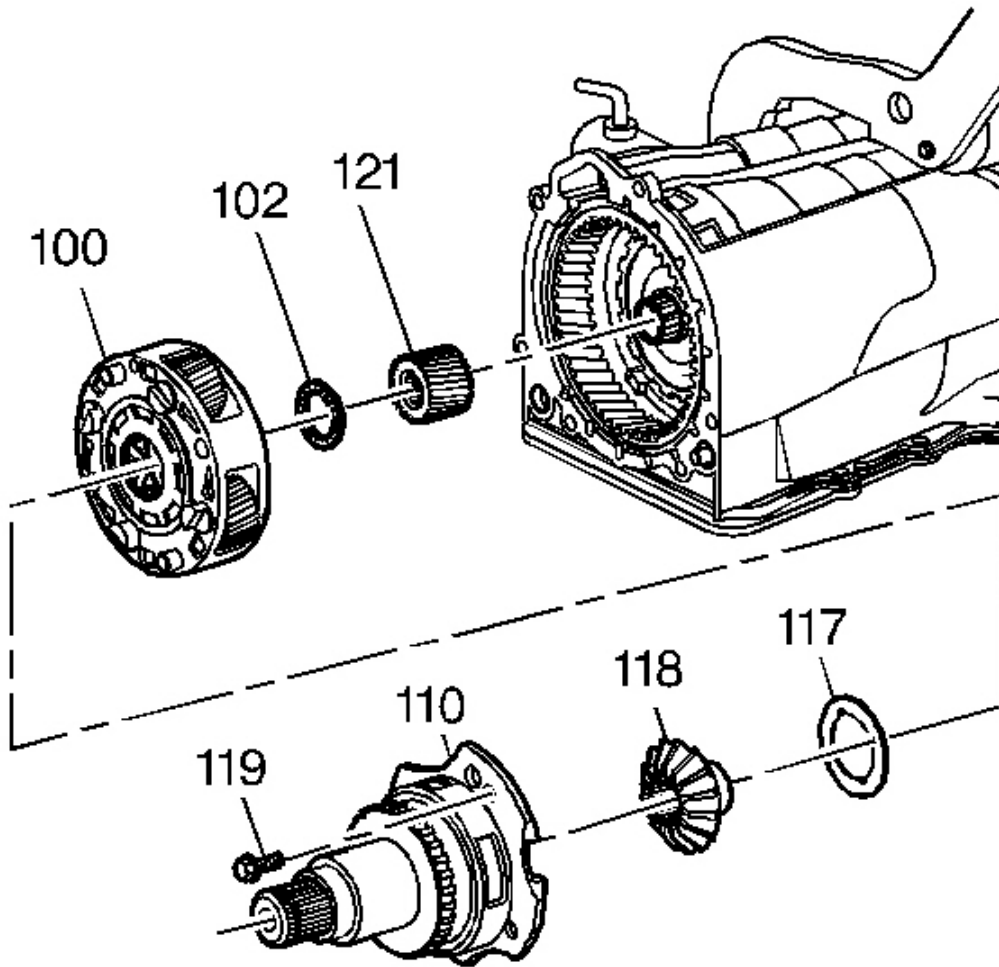


Fig. 309: View of Drive Carrier & Differential Carrier
Courtesy of GENERAL MOTORS CORP.

1. Install the sun gear (121) with the bushing side facing the differential (110).
2. Install the final drive carrier (100) with the thrust bearing (102) secured on the sun gear side. Turn the unit until the unit meshes with the sun gear and the internal gear teeth.
3. Install the left thrust washer (117). Install the left differential side gear (118).

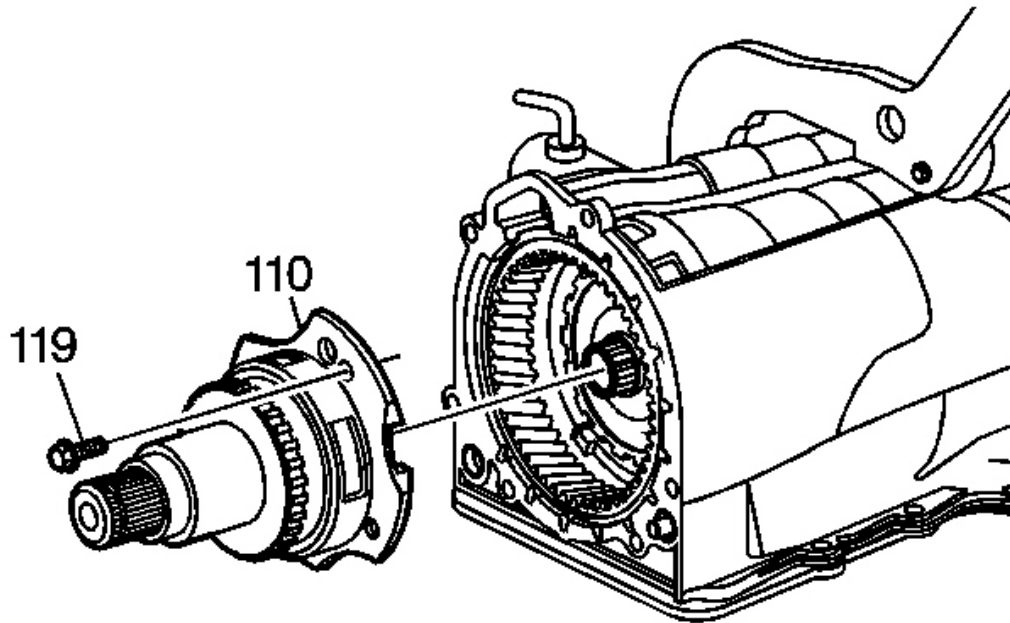


Fig. 310: Identifying Differential Housing Retaining Bolts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to FASTENER NOTICE in Cautions and Notices.

4. Place the transmission in Park using the manual shaft. Attach the differential housing (110) and four bolts (119). Locate dowels on the final drive carrier. Insert these dowels into holes in the differential carrier for proper assembly.

Tighten: Tighten the bolts using a star pattern to 70-76 N.m (52-56 lb ft).

OUTPUT SHAFT INSTALLATION

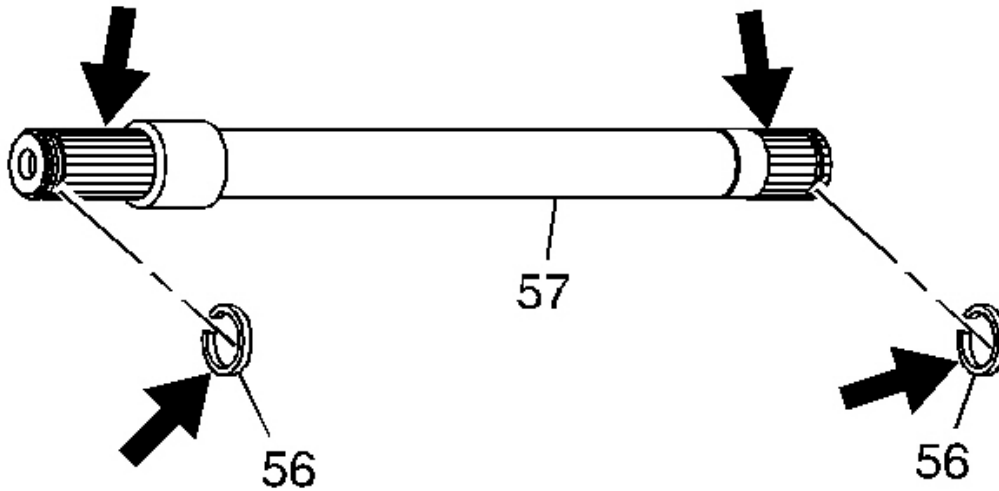


Fig. 311: Identifying Output Shaft & Snap Rings
Courtesy of GENERAL MOTORS CORP.

1. Inspect the output shaft (57) splines for burrs or damage. Inspect the snap rings (56) for overexpansion.

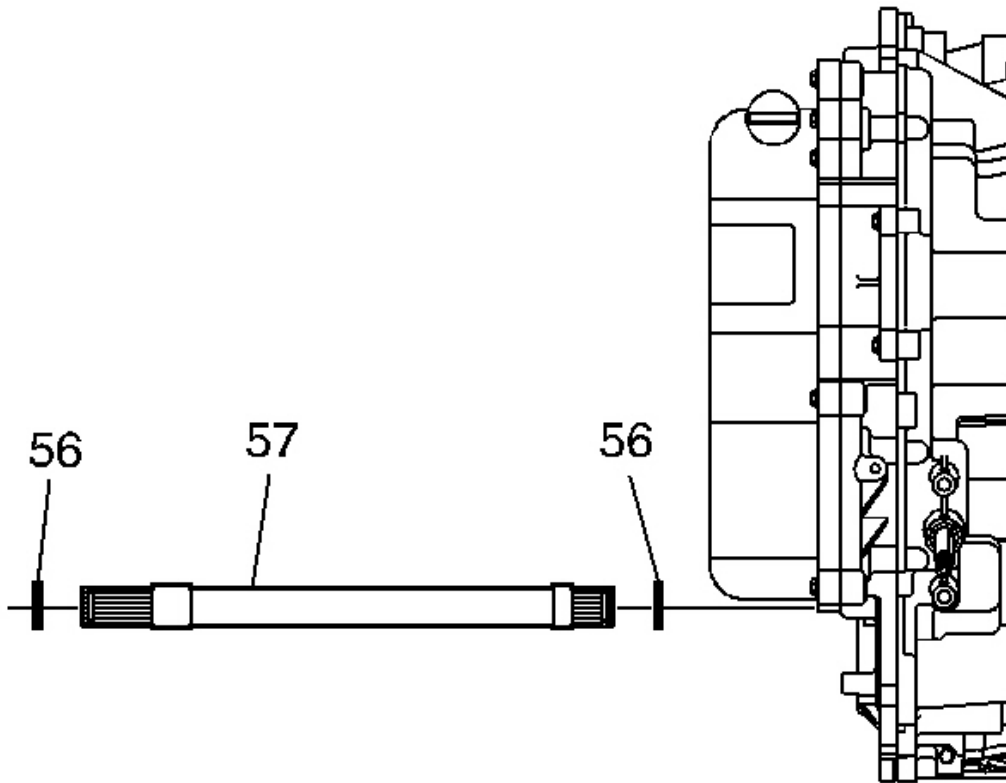


Fig. 312: Installing Snap Rings to Output Shaft
Courtesy of GENERAL MOTORS CORP.

2. Install the snap rings (56) onto the output shaft and install the output shaft (57) from the channel plate side of the transmission.

SCAVENGE PIPE INSTALLATION

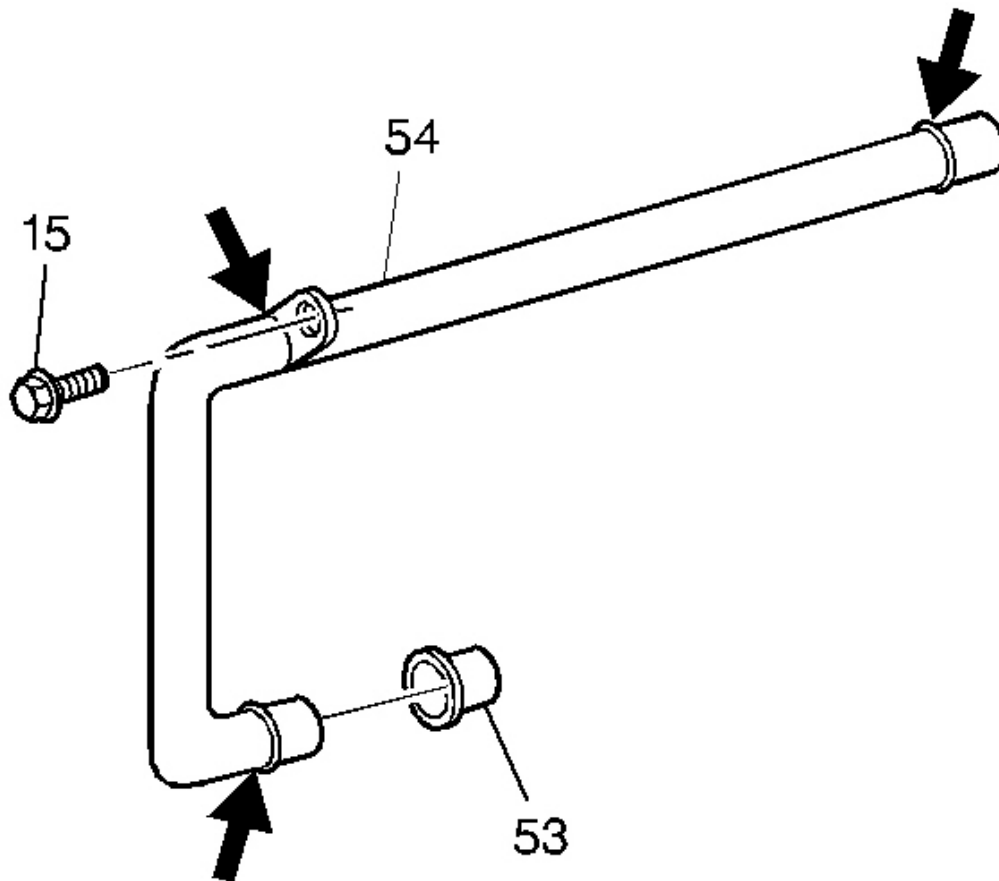


Fig. 313: View of Scavenge Tube
Courtesy of GENERAL MOTORS CORP.

1. Inspect the scavenge tube (54) for damage and clogging.

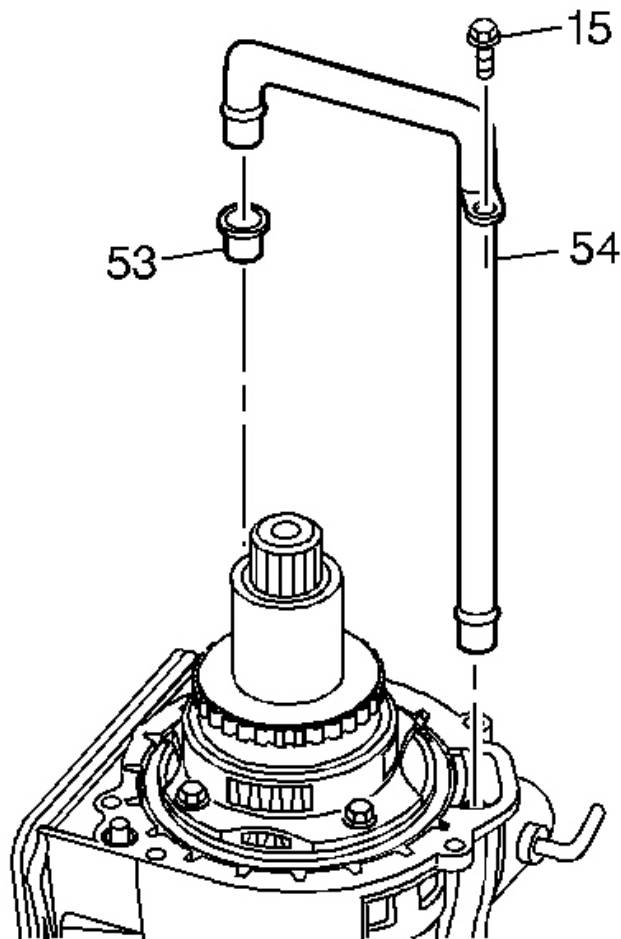


Fig. 314: Identifying Scavenge Tube & Seals
Courtesy of GENERAL MOTORS CORP.

2. Install the scavenge tube seal (53) into the case.
3. Install the scavenge tube (54) into the scavenge tube seals (53) located in the case and in the driven sprocket support. Tap the scavenge tube (54) lightly with a plastic hammer to ensure a tight fit in both seals.

NOTE: Refer to FASTENER NOTICE in Cautions and Notices.

4. Install the scavenge tube bolt (15).

Tighten: Tighten the bolt to 8-14 N.m (6-10 lb ft).

CASE EXTENSION INSTALL/FINAL DRIVE END PLAY CHECK

Tools Required

- **J 25025-7A** Dial Indicator Post
- **J 28585** Snap Ring Remover
- **J 8001** Dial Indicator

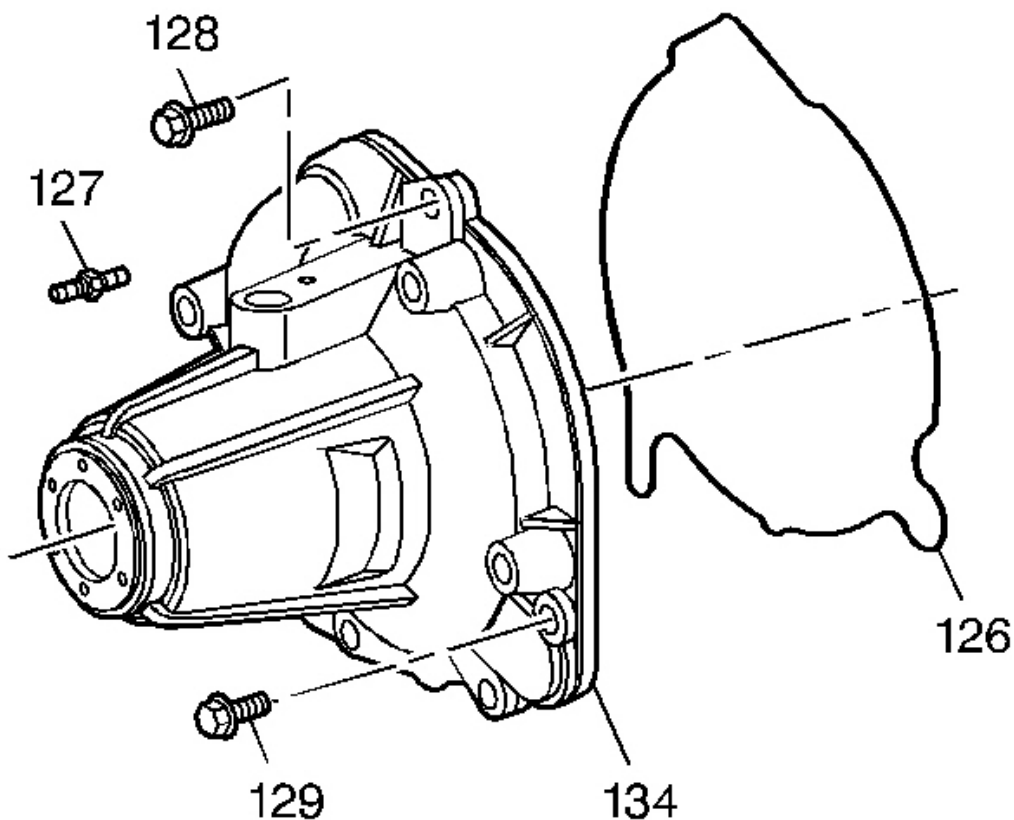


Fig. 315: View of Case Extension Seal
Courtesy of GENERAL MOTORS CORP.

1. Inspect the case to case extension seal (126).

2. Inspect the case extension mating surface for damage.

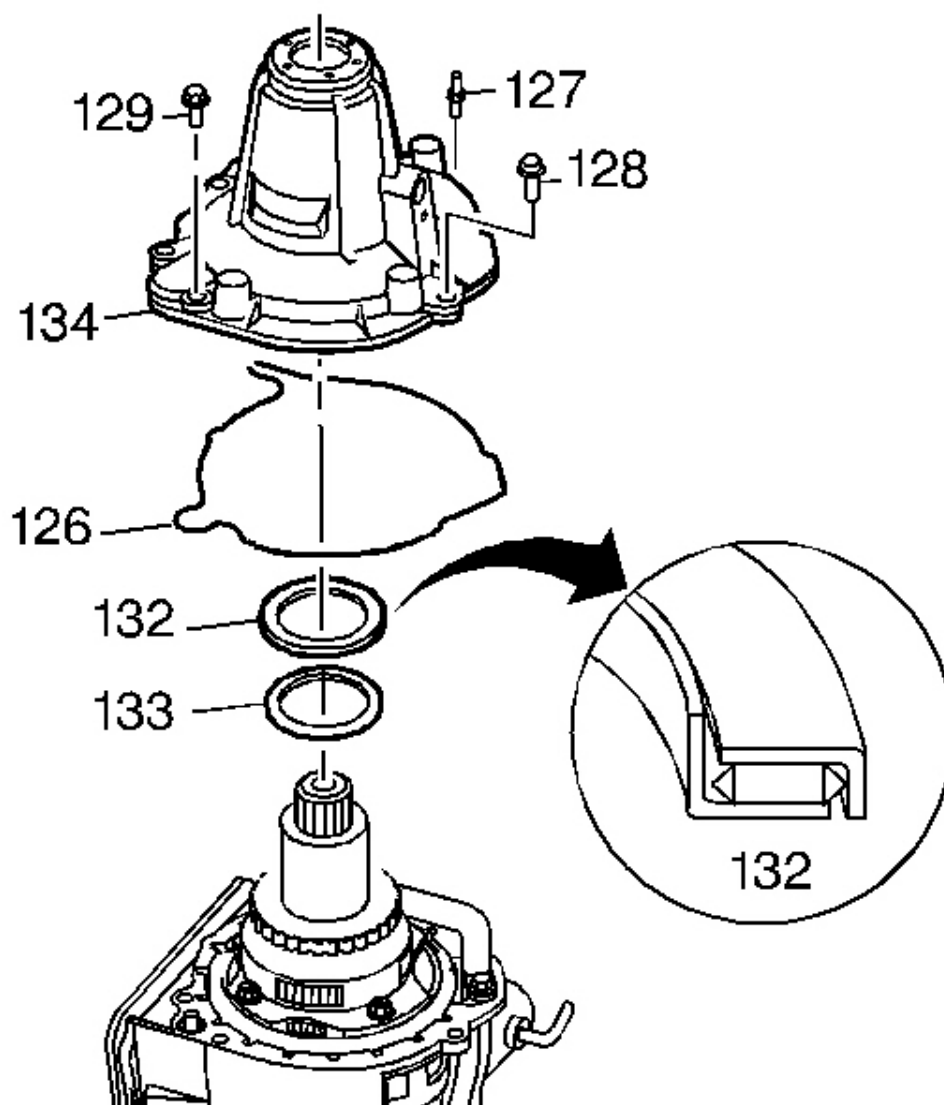


Fig. 316: View Of Case Extension Components
Courtesy of GENERAL MOTORS CORP.

3. Install the following parts:
 - The selective washer (133)

- The thrust washer (132)
- The case extension seal (126)
- The case extension (134)

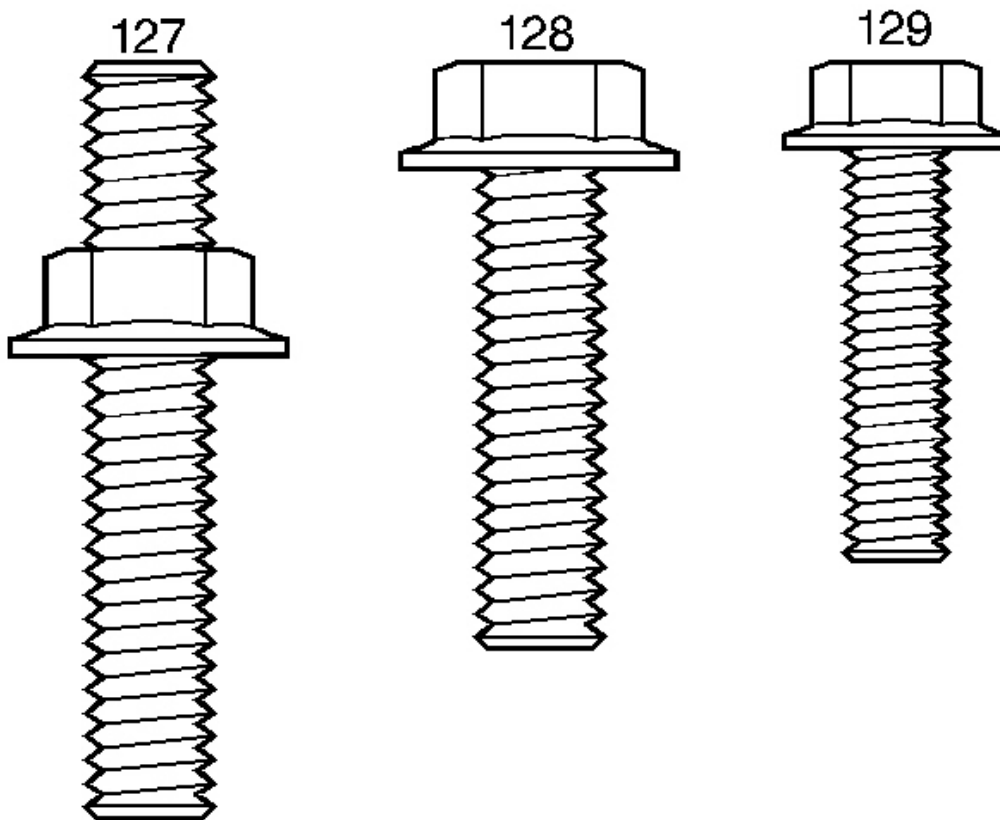


Fig. 317: Identifying Case Extension Bolts
Courtesy of GENERAL MOTORS CORP.

4. Apply pip thread sealant GM P/N 12346004 to bolt threads before installation. Install the case extension bolts (128, 129).
5. Hand tighten bolts (128, 129) until case extension (134) is seated onto case.

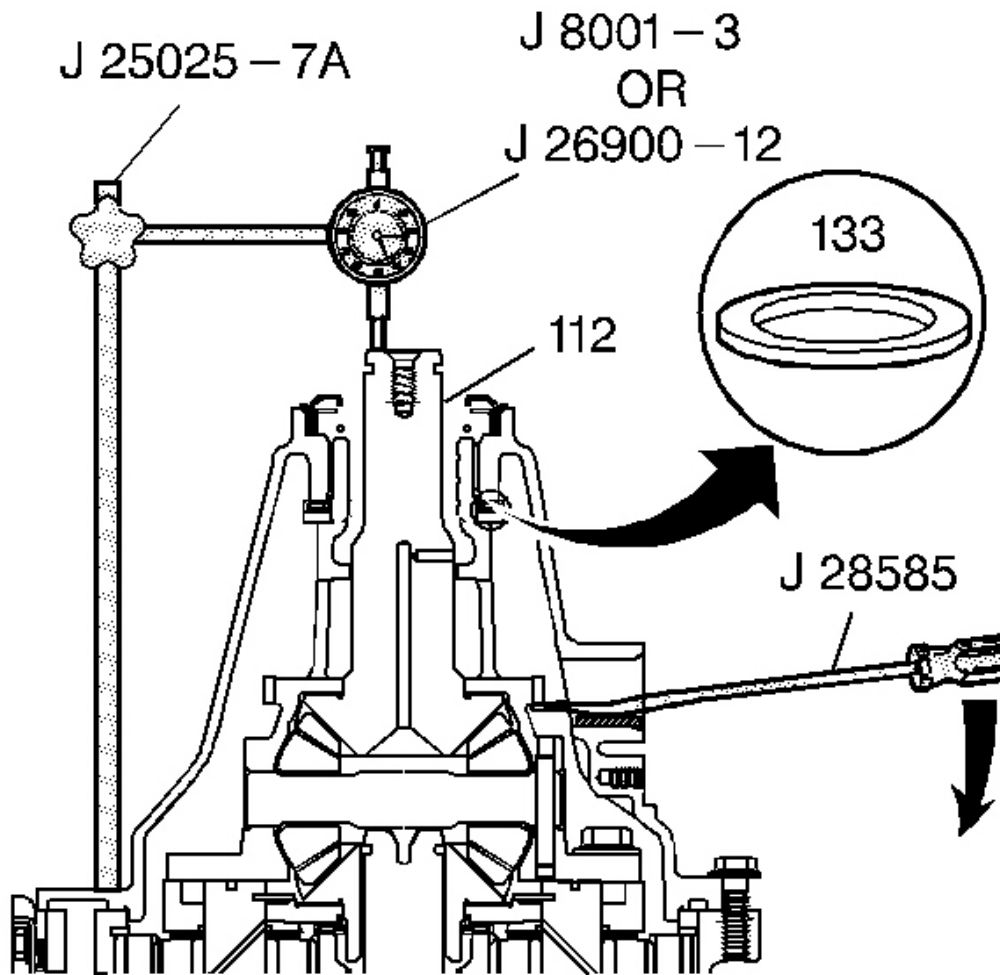


Fig. 318: Measuring End Play Clearance Using J 25025-7A, J 8001, & J 28585
 Courtesy of GENERAL MOTORS CORP.

NOTE: Failure to ensure that proper end play clearance exists, could lead to internal component damage.

6. Install the long **J 25025-7A** and the **J 8001**.
7. Position the dial indicator with the stem contacting the output shaft (112). Set the dial indicator to zero.
8. Insert the **J 28585** through the vehicle speed sensor bore and lift the speed sensor rotor for

measurement. Protect the bore with a piece of wood or a suitable piece of plastic.

9. Proper end play clearance is 0.15-0.65 mm (Eng. Spec.).
10. Record measured specification and, if necessary, adjust the clearance with the proper thickness selective thrust washer on reassembly. Refer to step 3.
11. Remove the dial indicator set and the post.

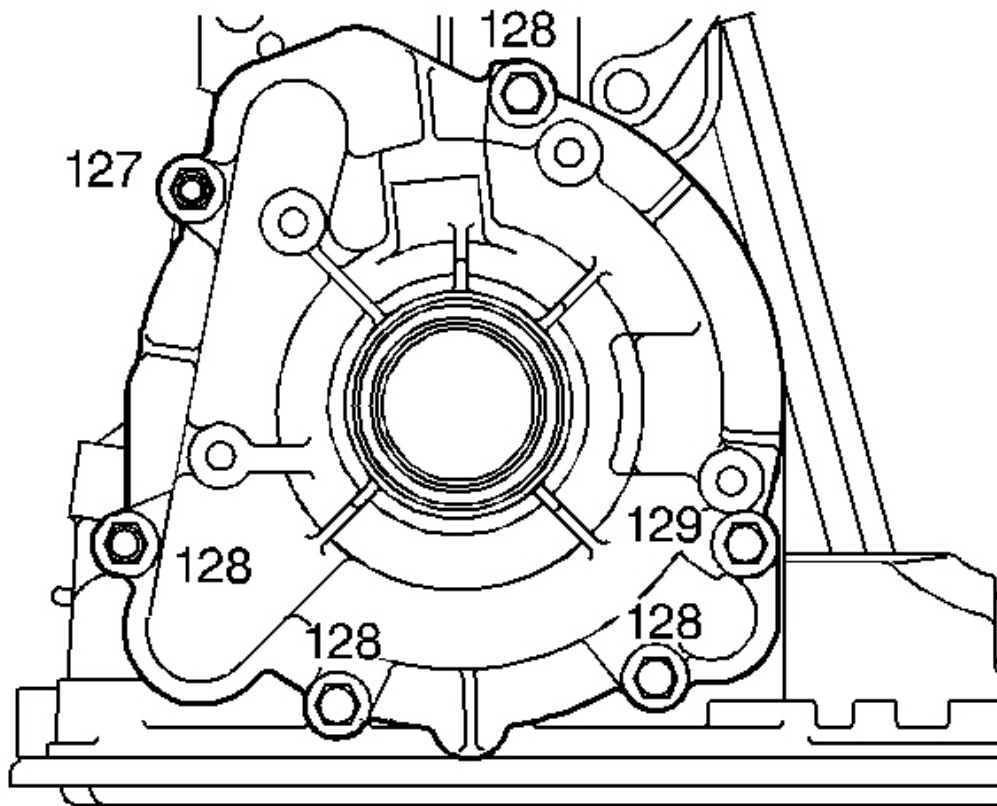


Fig. 319: Identifying Case Extension Bolts & Studs
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to **FASTENER NOTICE** in Cautions and Notices.

12. Install the stud (127).

Tighten:

- Tighten the bolt (128) and the stud (127) to 50-55 N.m (37-40 lb ft).
- Tighten the bolt (129) to 20-27 N.m (15-20 lb ft).

FOURTH SERVO OVERHAUL

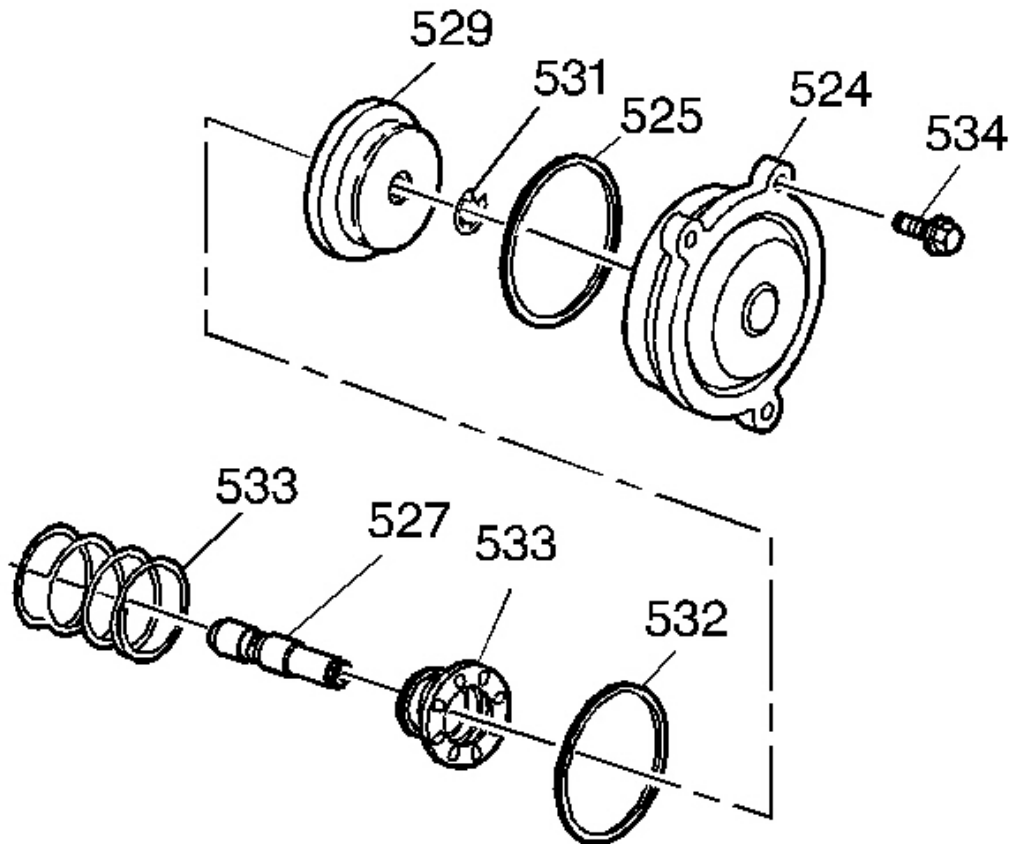


Fig. 320: View Of 4th Servo Piston Components
Courtesy of GENERAL MOTORS CORP.

1. Remove the following parts:
 - The 4th servo piston seals (532, 525)
 - The snap ring (531)
 - The apply pin (527)
 - The spring and retainer assembly (533)

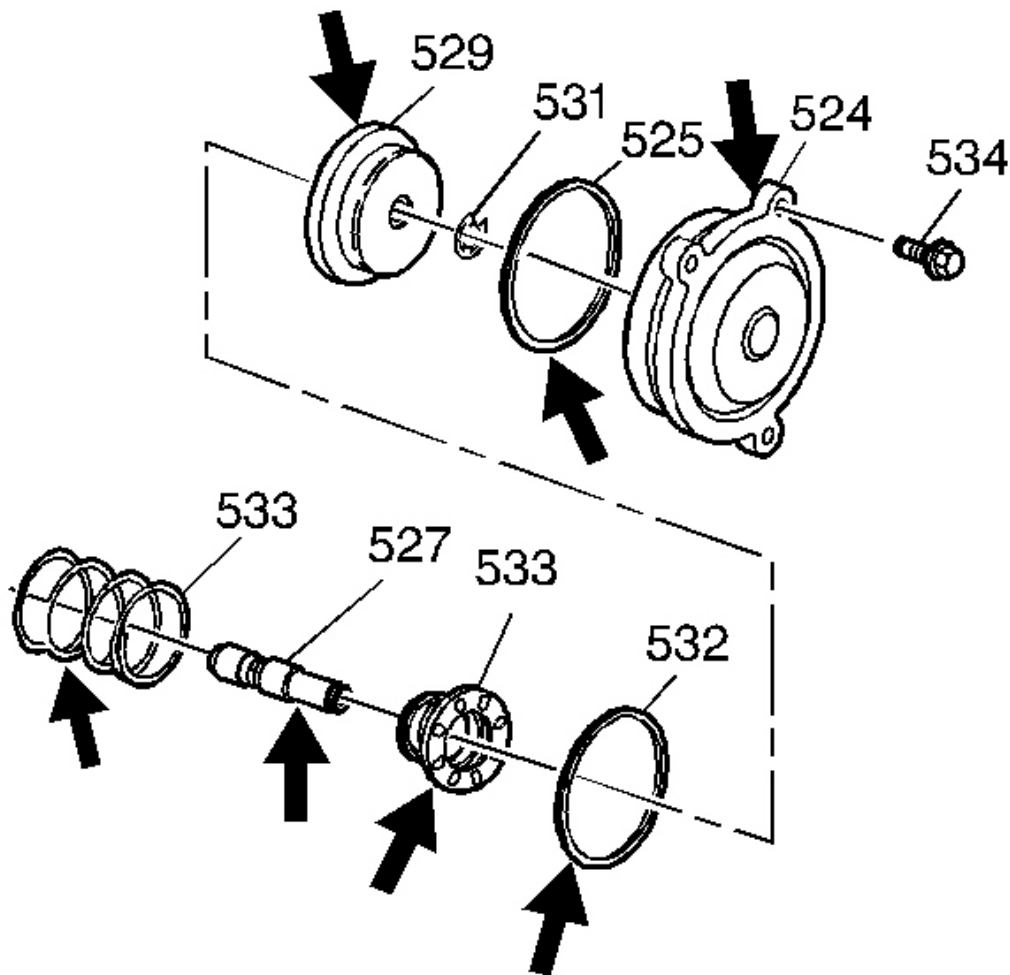


Fig. 321: 4th Servo Piston Components Inspection Areas
Courtesy of GENERAL MOTORS CORP.

2. Inspect the following parts:

- The 4th servo piston (529) for cracks
- The apply pin (527) for damage
- The spring and retainer assembly (533) for damage
- The servo cover (524) for damage

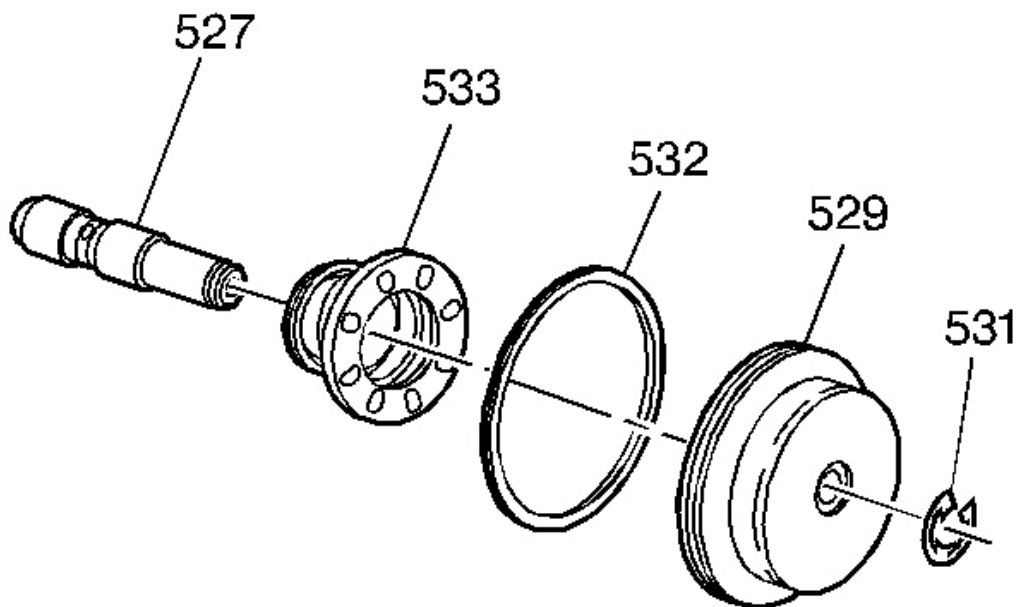


Fig. 322: Identifying 4th Servo Piston Components
Courtesy of GENERAL MOTORS CORP.

3. Install the following parts:

- The new piston seal (532) onto the 4th servo piston (529)
- The apply pin (527)
- The spring retainer (533) into the 4th servo piston (529)
- Attach the snap ring (531) to the apply pin (527).

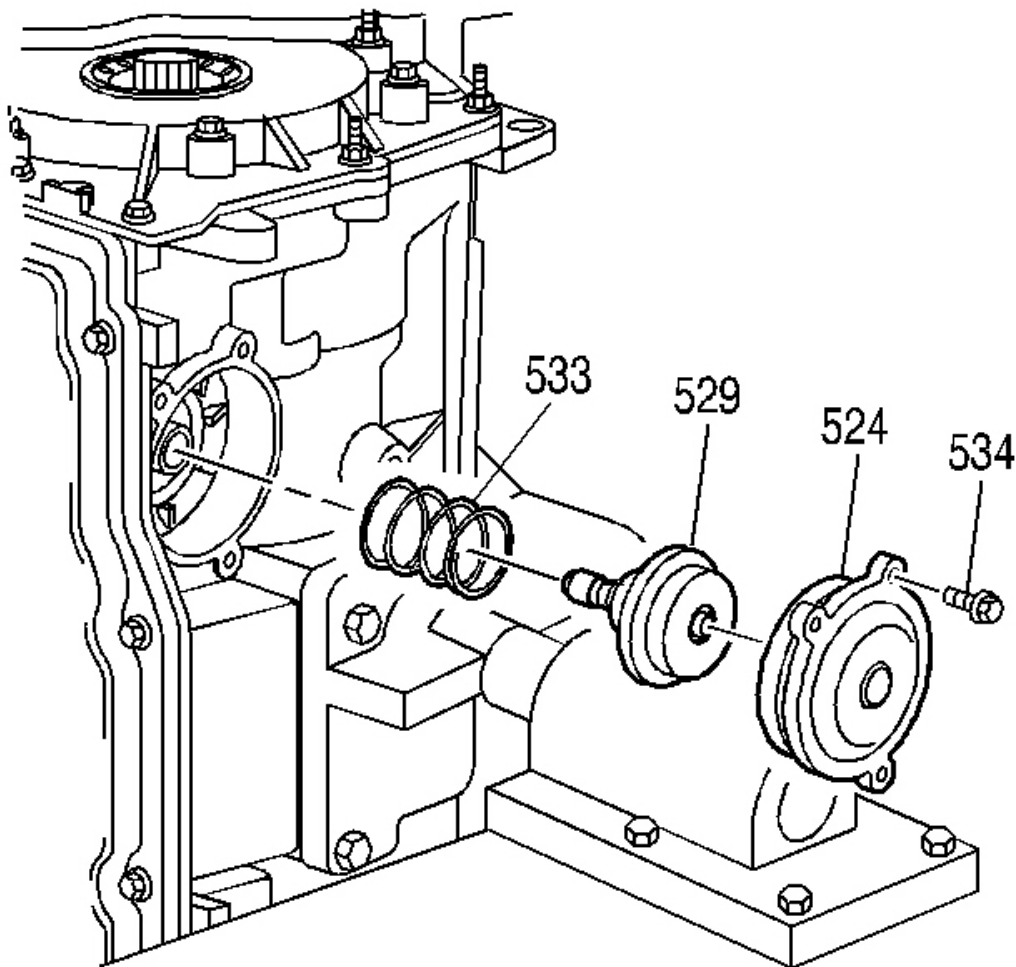


Fig. 323: Identifying 4th Servo Piston Assembly And Cover
Courtesy of GENERAL MOTORS CORP.

4. Install the 4th servo piston assembly (529) and the spring (533) into the 4th servo cover (524).

Apply pipe thread sealant GM P/N 12346004 to bolt threads before installation.

5. Install the 4th servo piston and cover assembly into the case.

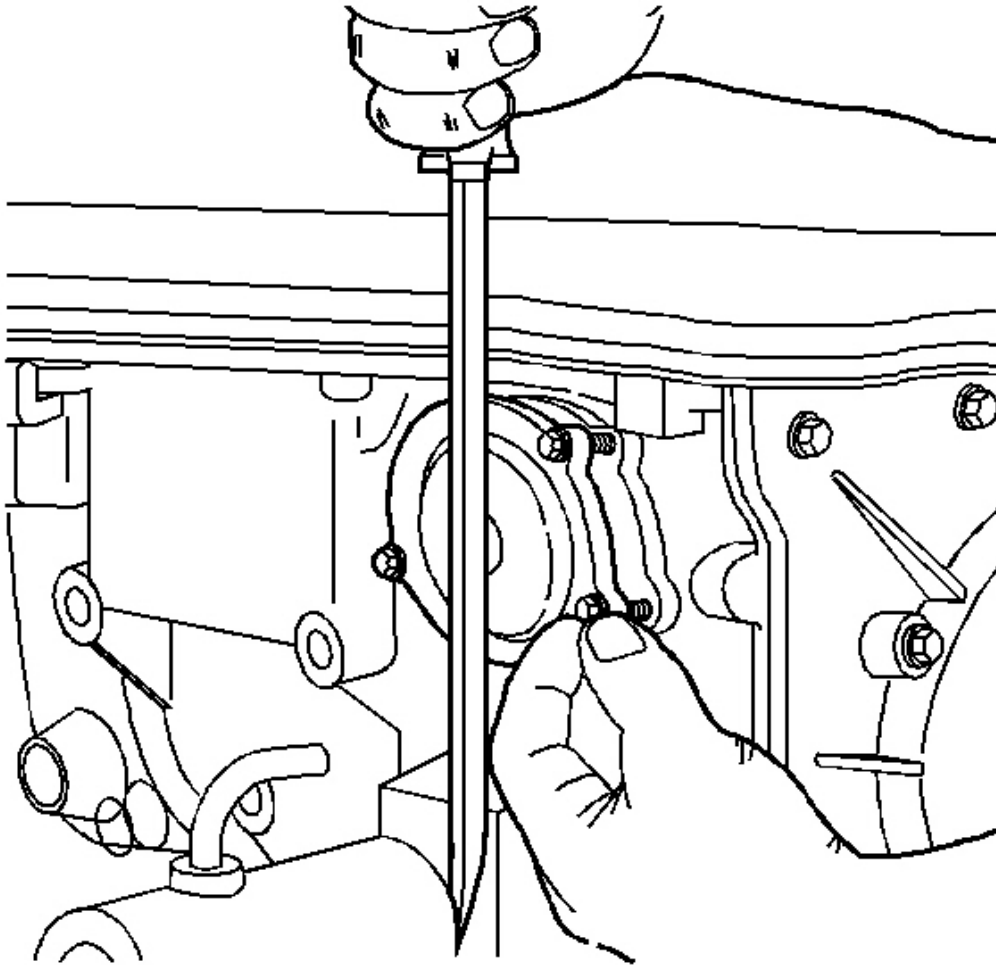


Fig. 324: Installing 4th Servo Cover Bolts While Compressing Piston
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to **FASTENER NOTICE** in Cautions and Notices.

6. Install the 4th servo cover bolts into the case. Hand tighten the bolts while holding the piston compressed.

Tighten: Tighten the bolts in a star pattern to 8-14 N.m (6-10 lb ft).

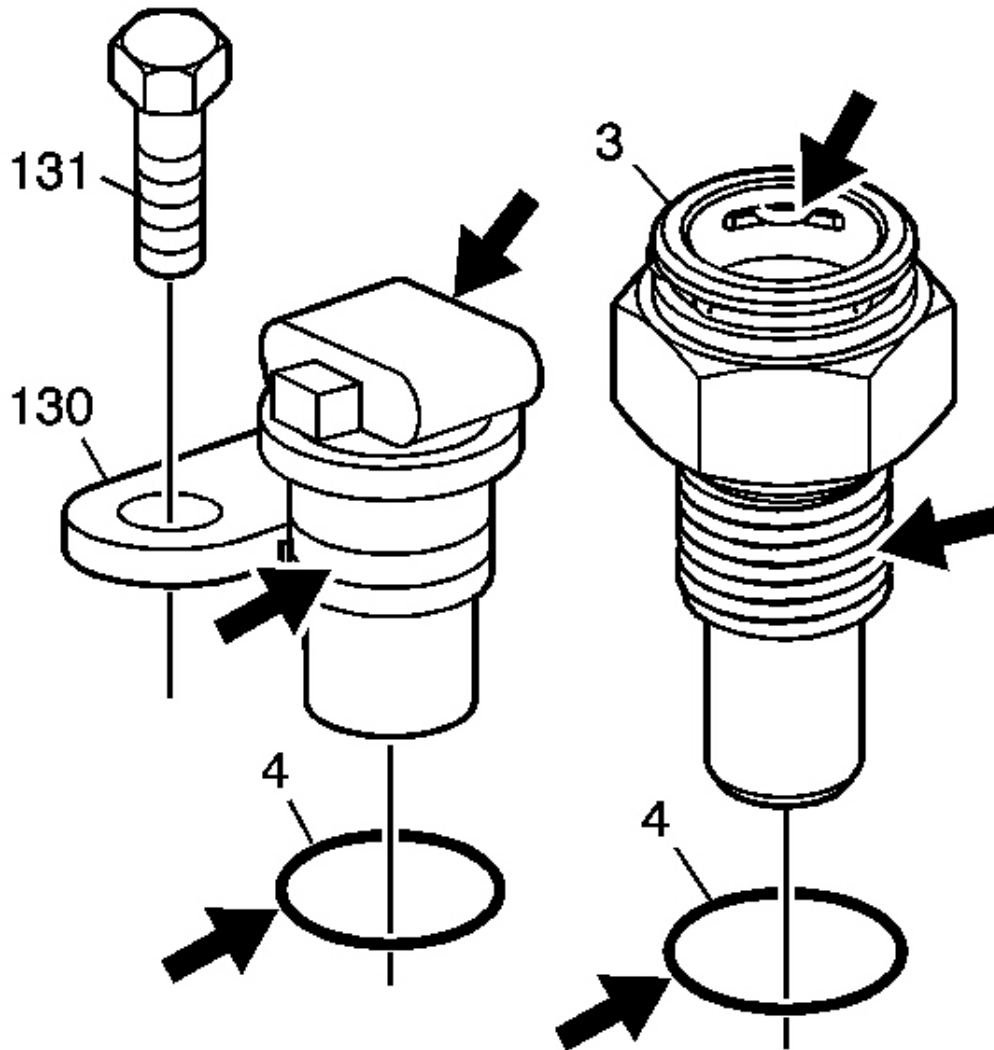


Fig. 325: Output Speed Sensor (OSS)
Courtesy of GENERAL MOTORS CORP.

1. Inspect the output speed sensor (130) for damage or a cut seal (4).
2. Inspect the cooler connector (3) for damaged threads, clogging, or a cut seal (4).

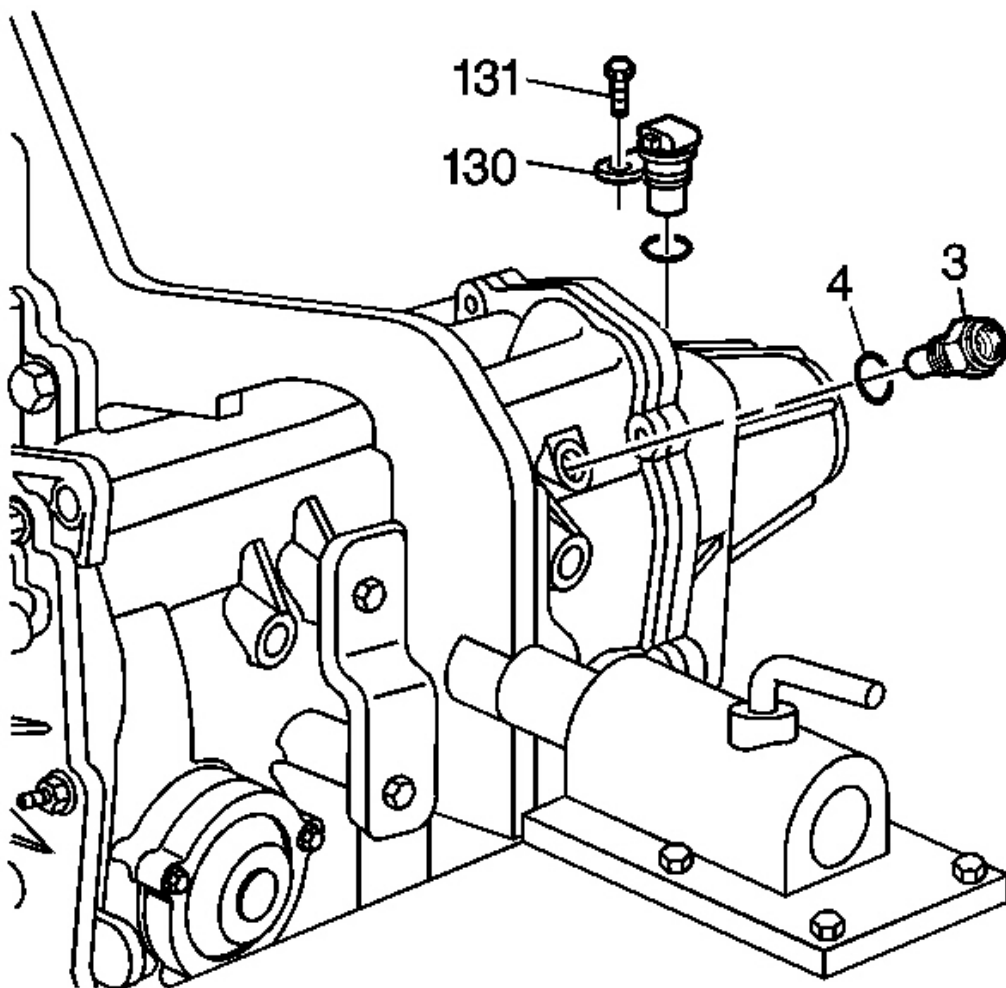


Fig. 326: Output Speed Sensor & Seal
Courtesy of GENERAL MOTORS CORP.

3. Install the output speed sensor (130) and the seal (4).

NOTE: Refer to FASTENER NOTICE in Cautions and Notices.

4. Install the output speed sensor bolt (131).

Tighten: Tighten the bolt to 8-14 N.m (6-10 lb ft).

5. Install the cooler fitting (3) and the new seal (4) or fitting (38) and seal (39) into the case.

Tighten: Tighten the cooler fitting to 25-29 N.m (19-21 lb ft).

AXLE SEALS REPLACEMENT

Tools Required

- **J 39051-1** Right Seal Driver. See Special Tools.
- **J 39051-2** Left Seal Driver. See Special Tools.

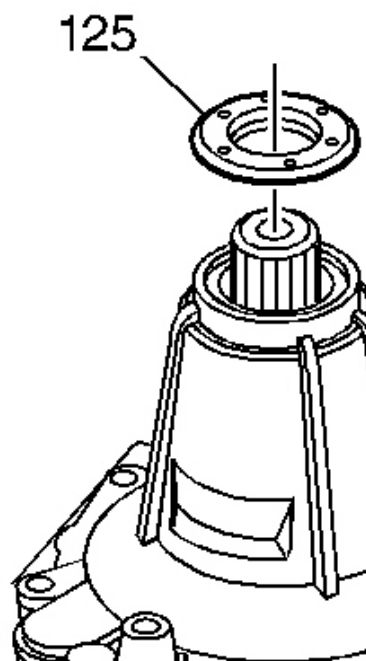
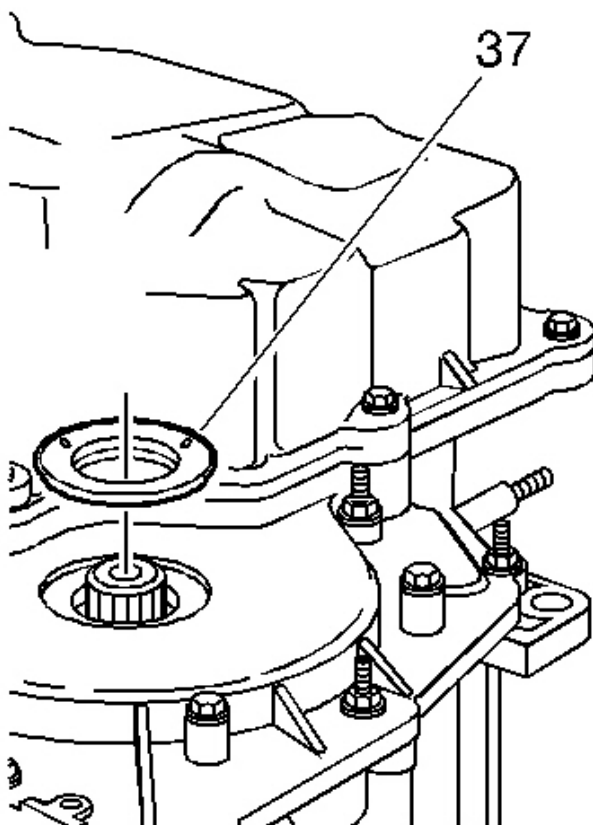


Fig. 327: Prying Out Right And Left Axle Seals
Courtesy of GENERAL MOTORS CORP.

1. Using a screw driver remove the right and left axle seals (37, 125) by prying them out.

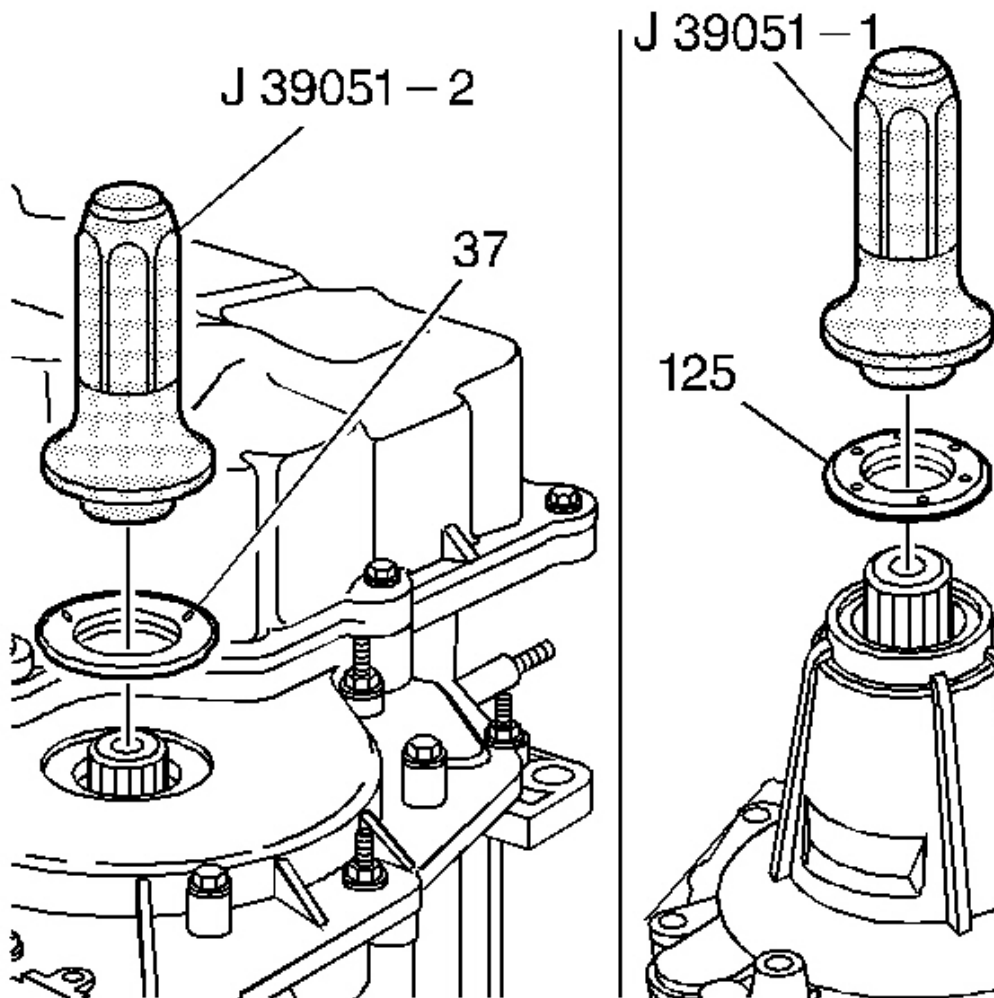


Fig. 328: Installing Axle Seals With J 39051-1 & J 39051-2
Courtesy of GENERAL MOTORS CORP.

2. Using the J 39051-1 and the J 39051-2 , install the new axle seals (37, 125). See **Special Tools**. Use the output shaft (57) to pilot the seals and the tool into the case. Ensure that the

snap rings are installed on the output shaft.

TORQUE CONVERTER AND OIL PUMP DRIVE SHAFT INSTALL

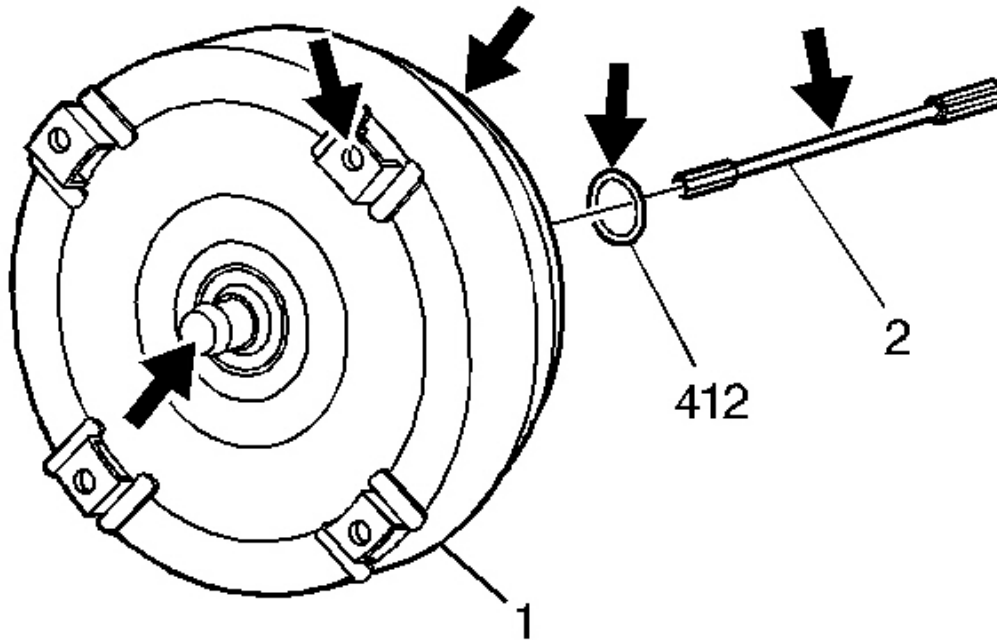


Fig. 329: Locating Inspection Points On Torque Converter
Courtesy of GENERAL MOTORS CORP.

1. Inspect the torque converter (1) lugs for damage and inspect the oil pump driven shaft for damage. Replace the turbine shaft seal (412).

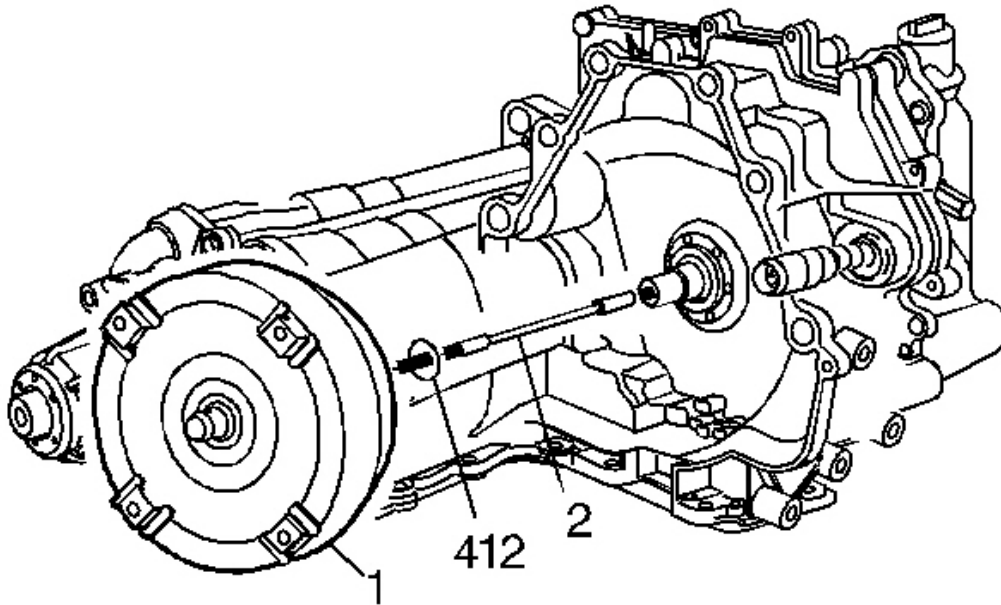


Fig. 330: Oil Pump Driven Shaft & Torque Converter
Courtesy of GENERAL MOTORS CORP.

2. Install the following parts:
 - The oil pump driven shaft (2) into the turbine shaft
 - The new turbine shaft O-ring seal (412)
 - The torque converter (1)
3. Remove the transmission from the base and then remove the holding fixture from the transmission.

DESCRIPTION AND OPERATION

PARK - ENGINE RUNNING

When the gear selector lever is in the Park (P) position and the engine is running, fluid is drawn into the scavenger pump from the bottom pan and routed into the side cover. From the side cover, fluid is drawn through the main filter into the primary and secondary oil pump assemblies. Line pressures from the primary and secondary oil pump assemblies are then directed to the following control devices:

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Pressure Regulation

Pressure Regulator Valve

This valve regulates the pump output in response to several forces: torque signal, fluid pressure, reverse gear, orificed line pressure and spring force. Line pressure from this valve is then routed to the actuator feed limit valve, the 1-2 & 3-4 accumulator valve, the 2-3 accumulator valve, and the converter clutch regulating valve.

Actuator Feed Limit Valve

The line pressure is limited to a maximum force as it passes through the actuator feed limit valve and enters the actuator feed circuit. Actuator feed is then routed to the pressure control solenoid valve, and into the fluid circuits of the 1-2 and the 2-3 shift solenoid valves.

Shift Accumulation

1-2 & 3-4 Accumulator Valve

This valve is biased by the torque signal, the third clutch and the orificed primary accumulator pressures. This valve regulates primary accumulator pressure. Fluid pressure from the primary accumulator is routed to the spring side of the forward accumulator piston, checkball #2 and checkball #3.

#2 Checkball (Primary Accumulator/1-2 Accumulator)

The #2 checkball is located in the accumulator housing. The checkball is seated against the spacer plate in order to route primary accumulator fluid through orifice #14 and to the spring side of the 1-2 accumulator piston.

#3 Checkball (Primary Accumulator/3-4 Accumulator)

The #3 checkball is located in the accumulator housing. The checkball is seated against the spacer plate in order to route primary accumulator fluid through orifice #13 and to the spring side of the 3-4 accumulating piston.

2-3 Accumulator Valve

This valve is biased by the torque signal and by the orificed secondary 2-3 accumulator pressures and the spring force. The 2-3 accumulator valve regulates the 2-3 accumulator circuit pressures. Line pressure at the valve feeds into the secondary 2-3 accumulator circuit and is then routed to checkball #10.

#10 Checkball (2-3 Accumulator)

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

The #10 checkball is located in the case cover. The checkball is seated against the spacer plate in order to route secondary 2-3 accumulator fluid through orifice #32 and then into the 2-3 accumulator circuit. Fluid from the 2-3 accumulator is then routed to orifice #32 and then to the spring side of the 2-3 accumulating piston.

Hydraulic Controls

Manual Valve

The manual valve is mechanically controlled through the gear selector lever. The valve directs line pressure from the pressure regulator valve to the pressure switches and also into the PRN, the PRND4 and the PRND43 circuits.

Internal Mode Switch (IMS)

The internal mode switch (IMS) is a sliding contact electrical switch assembly that corresponds to the PRNDL position selected. Each of the PRNDL positions has a unique ground pattern on the five wires from the TCM. The IMS consists of two major components: The housing, which houses the tracks and makes up the stationary contacts. The Insulator assembly makes up the moving contacts and is linked to the detent lever. The range detection is accomplished by securing the moving contacts of the IMS to the detent lever. When the driver selects a PRNDL position, the detent lever inside the transaxle rotates. This slides the IMS moving contacts which in return grounds the five wires in a unique pattern for each gear selection corresponding to the PRNDL position selected. The IMS is electrically connected by six wires (five of which the TCM supplies voltage to and one wire that is a common ground) to the transaxle pass through connector.

Pressure Control (PC) Solenoid Valve Feed Filter

The PC solenoid valve feed filter is located in the valve body. This device filters the actuator feed fluid before the fluid is routed to the PC solenoid valve.

Pressure Control (PC) Solenoid Valve

The Pressure Control (PC) Solenoid Valve is controlled by the PCM. This valve regulates the filtered actuator feed pressure which enters the torque signal circuit. Torque signal fluid is then routed to the pressure regulator valve, the 1-2 & 3-4 accumulator valve, and the 2-3 accumulator valve.

The 1-2 Shift Solenoid (SS) Valve

The 1-2 SS valve is energized (turned ON) by the PCM, blocking the exhaust port through the solenoid. This creates high pressure in the 1-2 shift solenoid valve circuit. Solenoid pressure holds the 1-2 shift valve in the downshifted position. This pressure is also routed to the 3-4 shift valve.

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

The 2-3 Shift Solenoid (SS) Valve

The 2-3 SS valve is de-energized (turned OFF) by the PCM, which allows fluid in the solenoid valve circuit to exhaust. Filtered actuator feed enters the solenoid valve circuit through orifice #16. This feed exhausts through the solenoid valve.

The 1-2 Shift Valve

High pressure from the 1-2 SS valve holds this valve in the downshifted position. PRN fluid passes between two valve lands and enters the Low & Reverse band apply fluid passage.

The 3-4 Shift Valve

Fluid from the 1-2 SS valve is routed to the end of the 3-4 shift valve against spring force, holding it in an upshifted position.

#6 Checkball (Low/Reverse Band Apply/Reduce)

This checkball is located in the valve body. The checkball seats against the Low & Reverse band reduce passage and routes fluid to the Low & Reverse servo piston.

Torque Converter/Cooler and Lube

Refer to **Reverse**.

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

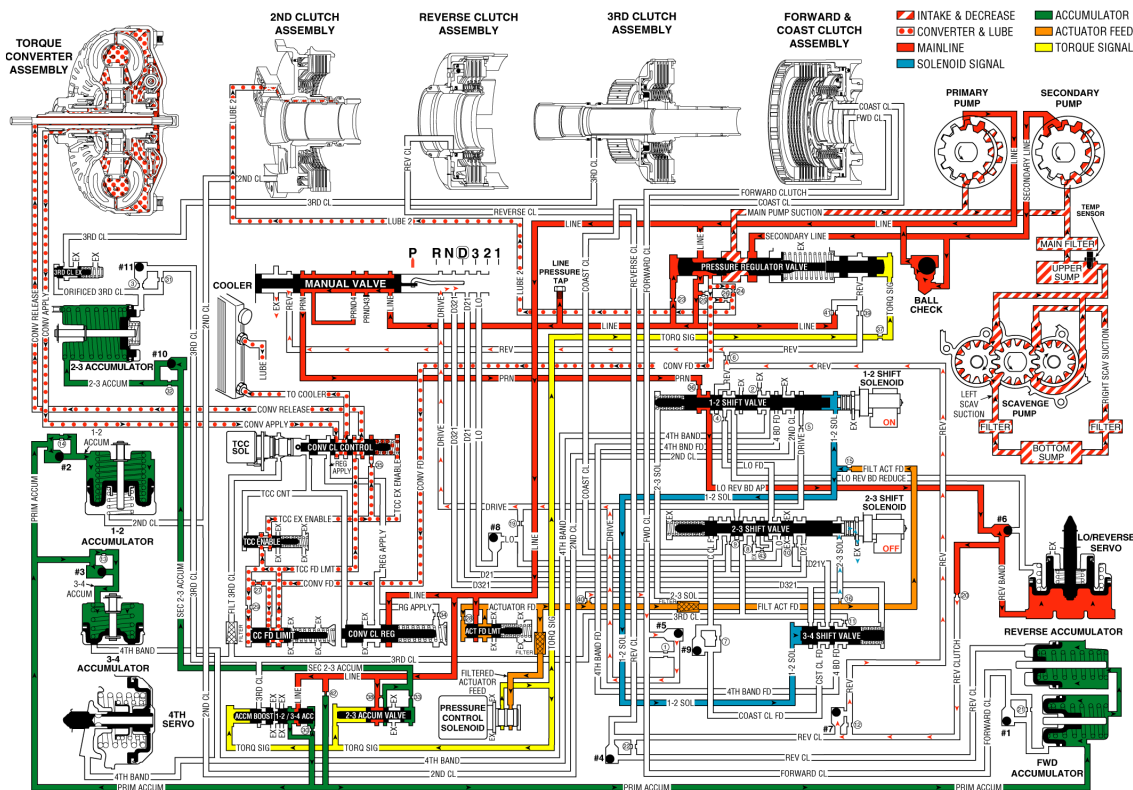


Fig. 331: Park - Engine Running Fluid Flow Diagram
Courtesy of GENERAL MOTORS CORP.

REVERSE

When the gear selector lever moves to the Reverse (R) position, the following changes occur to the hydraulic and electrical systems inside the transmission:

Pressure Regulation

Manual Valve

The gear selector lever mechanically moves the manual valve. While this is occurring, the valve directs line pressure through the PRND4 fluid passage into the reverse circuit. Reverse fluid then routes to the pressure regulator valve and to the reverse orifice bypass valve. Reverse fluid then passes through orifice #6. The fluid seats checkball #7 before routing to the 1-2 shift valve.

Internal Mode Switch (IMS)

The internal mode switch (IMS) is a sliding contact electrical switch assembly that corresponds to the PRNDL position selected. Each of the PRNDL positions has a unique ground pattern on the five wires from the TCM. The IMS consists of two major components: The housing, which houses the tracks and makes up the stationary contacts. The Insulator assembly makes up the moving

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

contacts and is linked to the detent lever. The range detection is accomplished by securing the moving contacts of the IMS to the detent lever. When the driver selects a PRNDL position, the detent lever inside the transaxle rotates. This slides the IMS moving contacts which in return grounds the five wires in a unique pattern for each gear selection corresponding to the PRNDL position selected. The IMS is electrically connected by six wires (four of which the TCM supplies voltage to and one wire that is a common ground and one wire is connected directly to the ECM) to the transaxle pass through connector.

Pressure Regulator Valve

Reverse fluid pressure combines with torque signal fluid to increase hydraulic pressure in the line circuit. A change to the vehicle operating conditions produces changes in the throttle position. The changes to the throttle position influence fluctuations in line pressure.

Reverse Clutch Applies

The #7 Checkball (Reverse/Reverse Clutch)

The #7 checkball is located in the valve body. The checkball is seated against the spacer plate in order to force reverse fluid through orifice #12 before the fluid enters the reverse clutch circuit.

The 1-2 Shift Valve

This valve operates in the downshifted position. The valve allows orificed PRN fluid to enter the Low & Reverse band apply fluid passage. Low & Reverse band apply fluid is then routed to checkball #6.

The #6 Checkball (Low/Reverse Band Apply/Reduce)

The #6 checkball is located in the valve body. The checkball is seated against the Low & Reverse band reduce passage. The checkball routes fluid into the Low & Reverse band apply circuit. Low & Reverse band apply is then routed to the Low & Reverse servo piston and actuates the piston.

The #4 Checkball (Reverse Clutch)

The #4 checkball is located in the accumulator housing. The checkball is unseated by reverse clutch fluid, allowing reverse clutch pressure to actuate the reverse accumulator piston.

Reverse Accumulator Assembly

Primary accumulator fluid on the spring side of the reverse accumulator piston is forced back through its circuit to the 1-2 & 3-4 accumulator valve. The 1-2 & 3-4 accumulator valve then regulates the exhaust of primary accumulator fluid.

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Torque Converter Cooler & Lube

Pressure Regulator Valve

Line pressure at the valve forces fluid through the converter feed circuit which then routes the fluid to the converter clutch feed limit valve. Fluid passes through the valve and enters the TCC feed limit circuit. The limited fluid amount is then routed through orifice #29 and enters the orificed feed limit passage. The limited fluid amount is also routed to the TCC enable valve and to the converter clutch control valve.

TCC Enable Valve

Spring force holds the TCC enable valve in the downshifted position. This allows a limited fluid amount to pass through the valve and enter the orificed TCC exhaust enable circuit. Orificed TCC exhaust enable fluid then routes to the converter clutch control valve.

Converter Clutch Control Valve

Spring force holds the Converter Clutch Control valve in the downshifted position. Orificed TCC exhaust enable fluid routes to the spring end of the valve and through orifice #35, where the fluid enters the TCC exhaust enable circuit. At the same time, a limited fluid amount routes through the valve and enters the converter release circuit.

Torque Converter

Converter release fluid routes to the cover side of the TCC pressure plate, keeping the pressure plate in the released position. The fluid which is released from the converter passes around the plate and enters the converter apply circuit. This routes the fluid back to the converter clutch control valve.

Converter Clutch Control Valve

Converter apply fluid routes through the valve, through the transmission cooler, and into the lube circuits through the transmission.

2006 Buick Lucerne CXS

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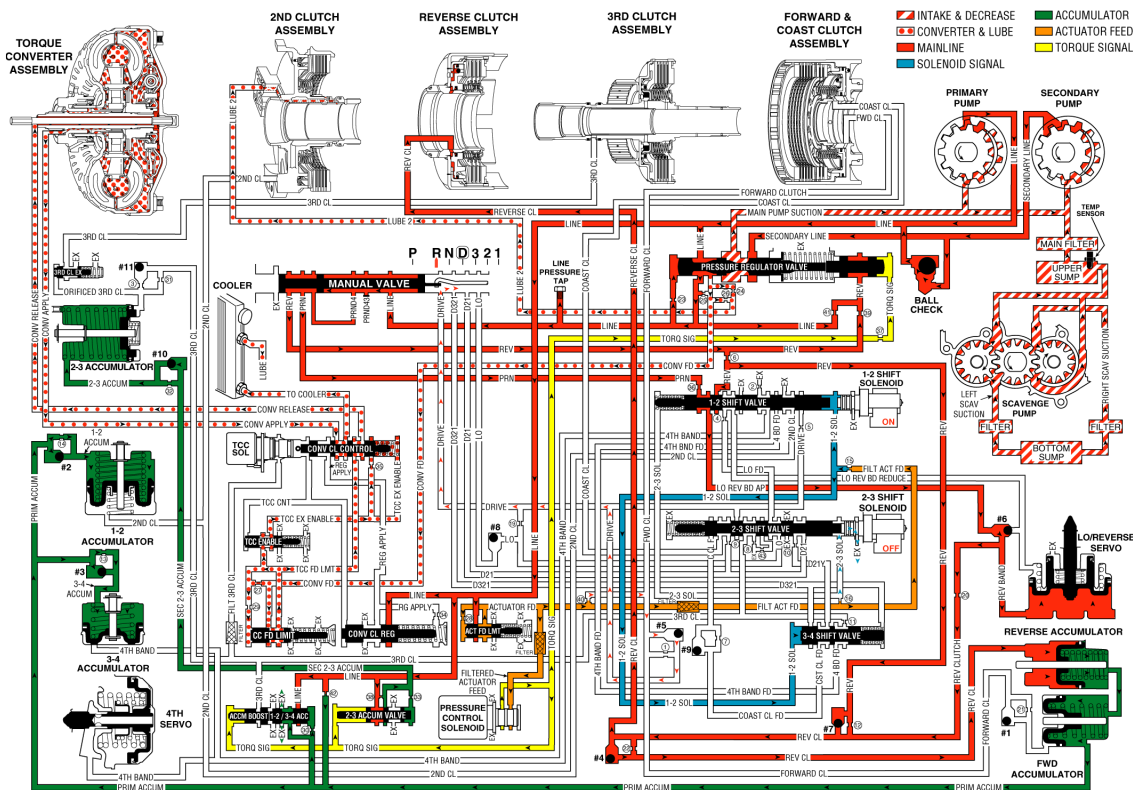


Fig. 332: Reverse Fluid Flow Diagram
Courtesy of GENERAL MOTORS CORP.

NEUTRAL - ENGINE RUNNING

When the gear selector lever moves to the Neutral (N) position from the Reverse (R) position, the following changes to the hydraulic and the electrical systems in the transmission occur:

Reverse Clutch Releases

Manual Valve

Mechanically controlled through the gear selector lever, the manual valve directs line pressure into the PRND43 and the PRND4 circuits. PRND4 fluid then passes around a valve land and enters the PRN fluid passage.

Internal Mode Switch (IMS)

The internal mode switch (IMS) is a sliding contact electrical switch assembly that corresponds to the PRNDL position selected. Each of the PRNDL positions has a unique ground pattern on the five wires from the TCM. The IMS consists of two major components: The housing, which houses the tracks and makes up the stationary contacts. The Insulator assembly makes up the moving contacts and is linked to the detent lever. The range detection is accomplished by securing the

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

moving contacts of the IMS to the detent lever. When the driver selects a PRNDL position, the detent lever inside the transaxle rotates. This slides the IMS moving contacts which in return grounds the five wires in a unique pattern for each gear selection corresponding to the PRNDL position selected. The IMS is electrically connected by six wires (five of which the TCM supplies voltage to and one wire that is a common ground) to the transaxle pass through connector.

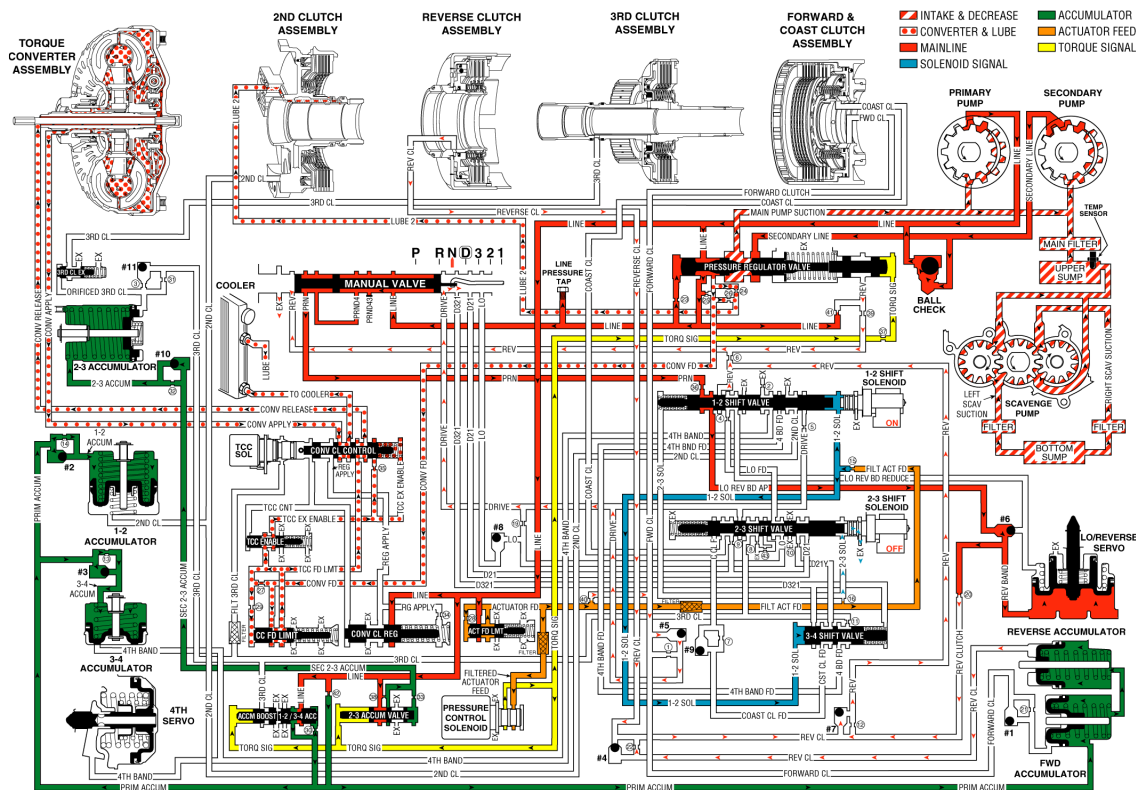


Fig. 333: Neutral - Engine Running Fluid Flow Diagram

Courtesy of GENERAL MOTORS CORP.

OVERDRIVE RANGE, FIRST GEAR

When the gear selector lever is moved to Overdrive Range D, the manual valve moves and allows line pressure to fill the drive fluid circuit. Changes to the hydraulic and the electrical systems in the transmission are as follows:

Forward Clutch Applies

Manual Valve

Mechanically controlled through the gear selector lever, the manual valve directs line pressure into the PRND43, the PRND4, and the drive circuits. Drive fluid pressure is then routed to checkball #5, to the forward orifice bypass valve, to the 1-2 shift valve, to the 2-3 shift valve, and through orifice #19.

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Internal Mode Switch (IMS)

The internal mode switch (IMS) is a sliding contact electrical switch assembly that corresponds to the PRNDL position selected. Each of the PRNDL positions has a unique ground pattern on the five wires from the TCM. The IMS consists of two major components: The housing, which houses the tracks and makes up the stationary contacts. The Insulator assembly makes up the moving contacts and is linked to the detent lever. The range detection is accomplished by securing the moving contacts of the IMS to the detent lever. When the driver selects a PRNDL position, the detent lever inside the transaxle rotates. This slides the IMS moving contacts which in return grounds the five wires in a unique pattern for each gear selection corresponding to the PRNDL position selected. The IMS is electrically connected by six wires (four of which the TCM supplies voltage to and one wire that is a common ground and one wire is connected directly to the ECM) to the transaxle pass through connector.

1-2 Shift Solenoid (SS) Valve

Energized by the PCM (turned ON), high pressure in the fluid circuit of the 1-2 SS valve holds the 1-2 shift valve in the downshifted position. The same pressure holds the 3-4 shift valve in the upshifted position.

1-2 Shift Valve

Held in the downshifted position, the 1-2 shift valve allows orificed Low feed fluid to pass through the valve and enter the Low & Reverse band reduce passage. Low & Reverse band reduce fluid is then routed to checkball #6. The fluid is also routed to the spring side of the Low & Reverse servo piston.

2-3 Shift Solenoid (SS) Valve

De-energized by the PCM (turned OFF), the 2-3 SS valve allows high pressure to exhaust through the solenoid while maintaining low pressure in the circuit at the 1-2 shift valve.

#5 Checkball (Drive and Forward Clutch)

Located in the valve body, drive fluid seats the #6 checkball against the spacer plate thereby routing drive fluid through orifice #1 into the forward clutch circuit. Forward clutch fluid is then routed to checkball #1 and to the forward clutch piston to apply the forward clutch.

#1 Checkball (Forward Clutch)

Located in the accumulator housing, the #1 checkball is unseated by forward clutch pressure. This allows forward clutch fluid to actuate the forward accumulator piston.

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Forward Accumulator

Forward clutch fluid actuates the forward accumulator piston during the apply of the forward clutch. Primary accumulator fluid on the spring side of the piston is forced back through its circuit to the 1-2 & 3-4 accumulator valve.

1-2 & 3-4 Accumulator Valve

Biased by torque signal and by orificed primary accumulator fluid pressures, this valve regulates the exhaust of primary accumulator fluid during the apply of the forward clutch.

2-3 Shift Valve

A spring force holds the 2-3 shift valve in the downshifted position. This valve allows Low feed fluid to pass through the valve and enter the Low fluid passage. Low fluid is then routed to checkball #8, where the fluid seats the checkball in order to prevent fluid from exhausting at the manual valve.

Low & Reverse Band Applied

Low & Reverse Servo

Low & Reverse band reduce fluid from the 1-2 shift valve seats checkball #6 against the Low & Reverse band apply passage. Fluid is then routed to the spring side of the Low & Reverse servo piston, and into the reverse clutch circuit. In this gear range the Low & Reverse band remains applied, despite the spring force and the Low & Reverse band pressure acting on the Low & Reverse servo piston.

#6 Checkball (Low & Reverse Band Apply, Reduce)

The #6 checkball is held against the Low & Reverse band apply circuit. The checkball routes fluid to the reverse clutch circuit. Reverse clutch fluid is then routed to the manual valve where the fluid exhausts.

1-2 Shift Valve

Operating in the downshifted position, Low & Reverse band apply fluid passes through the valve and enters the orificed PRN circuit. Orificed PRN fluid is then routed to the manual valve where the fluid exhausts.

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

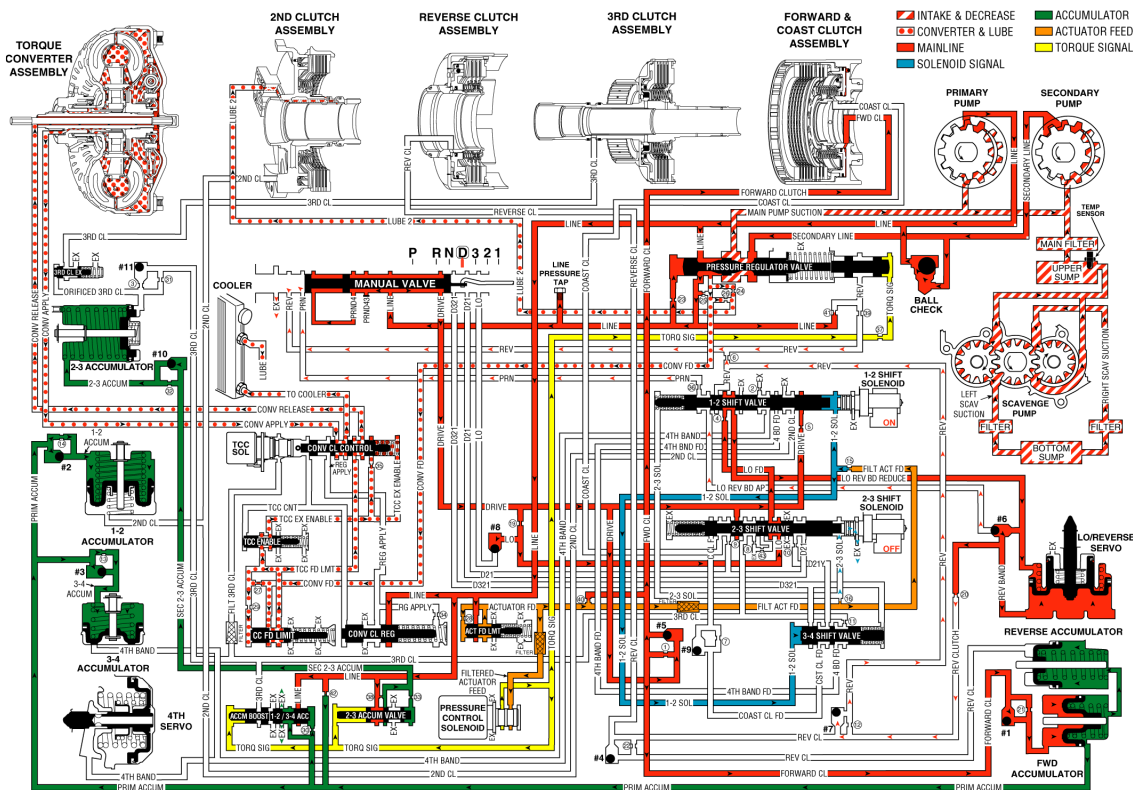


Fig. 334: Overdrive Range, First Gear Fluid Flow Diagram
Courtesy of GENERAL MOTORS CORP.

OVERDRIVE RANGE, SECOND GEAR

As the speed of the vehicle increases, the Powertrain Control Module (PCM) receives input signals from various engine and transmission sensors. The PCM uses this data to de-energize the 1-2 shift solenoid (SS) valve in order to shift the transmission into second gear at the appropriate time.

Second Clutch Applies

1-2 Shift Solenoid (SS) Valve

De-energized (turned OFF) by the PCM, the 1-2 SS valve exhausts fluid through the solenoid valve. This creates a low fluid pressure from the 1-2 SS valve in the circuit. This low solenoid pressure allows the 1-2 shift valve to move to the upshifted position. The 3-4 shift valve moves to the downshifted position.

1-2 Shift Valve

Spring force and low fluid pressure in the 2-3 shift solenoid (SS) valve hold the 1-2 shift valve in the upshifted position. The 1-2 shift valve allows orificed drive fluid to pass through the valve

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

into the second clutch circuit. Second clutch fluid is then routed to the 1-2 accumulator piston and to the second clutch piston in order to apply the clutch.

1-2 Shift Accumulation

1-2 Accumulator Piston

Second clutch fluid actuates the 1-2 accumulator piston. The fluid then forces the piston to move against spring force and 1-2 accumulator fluid on the opposite side of the piston. 1-2 accumulator fluid is then forced back through its circuit to checkball #2.

#2 Checkball (Primary Accumulator and 1-2 Accumulator)

The #2 checkball is located in the accumulator housing. The checkball is unseated by 1-2 accumulator fluid. This allows the fluid to enter the primary accumulator circuit. Primary accumulator fluid is then routed to the 1-2 & 3-4 accumulator valve.

1-2 & 3-4 Accumulator Valve

The 1-2 & 3-4 accumulator valve is biased by torque signal pressure and by orificed primary accumulator fluid. The valve regulates the exhaust rate of the 1-2 accumulator fluid during a 1-2 shift.

Low & Reverse Releases

Low & Reverse Servo

When the 1-2 shift valve is held in the upshifted position, an exhaust port is opened. Fluid in the Low & Reverse band reduce circuit exhausts at the valve while spring force, acting on the piston, forces the servo downward. The downward movement of the servo enables the release of the Low & Reverse band.

#6 Checkball (Low & Reverse Band Apply, Reduce)

The #6 checkball is positioned against the Low & Reverse band apply circuit. The checkball allows Reverse band fluid from the Low & Reverse servo piston to enter the Low & Reverse band reduce circuit. Fluid in the Low & Reverse band reduce circuit is then routed to the 1-2 shift valve where the fluid exhausts.

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

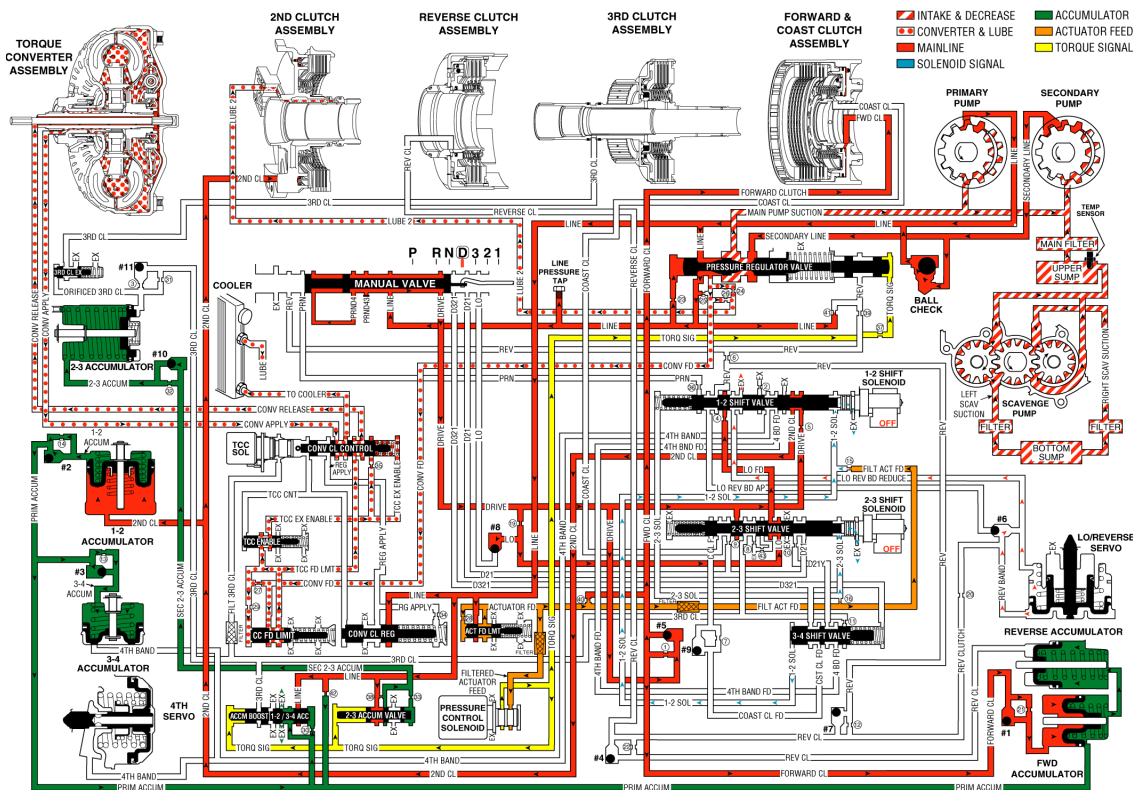


Fig. 335: Overdrive Range, Second Gear Fluid Flow Diagram
Courtesy of GENERAL MOTORS CORP.

OVERDRIVE RANGE, THIRD GEAR

As the speed of the vehicle increases, the Powertrain Control Module (PCM) receives input signals from various engine and transmission sensors. The PCM uses this data to energize the 2-3 shift solenoid (SS) valve in order to shift the transmission into third gear at the appropriate time.

Third Clutch Applies

2-3 Shift Solenoid (SS) Valve

The PCM energizes (turns ON) the 2-3 SS valve. The PCM blocks the exhaust of the 2-3 SS valve fluid to create high pressure in the 2-3 SS valve passage. High fluid pressure from the 2-3 SS valve moves the 2-3 shift valve into the upshifted position.

2-3 Shift Valve

High fluid pressure from the 2-3 SS valve holds the 2-3 shift valve in the upshifted position. The 2-3 shift valve allows drive fluid to pass between two valve lands and enter the third clutch circuit. Third clutch fluid is then routed to the third clutch piston, and the fluid applies the clutch. In addition, third clutch fluid is routed to the following components:

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

- Checkball #11
- 2-3 Accumulator Piston
- Third Clutch Exhaust Valve
- Torque Converter Clutch (TCC) Solenoid Valve
- 3-4 Shift Valve

#11 Checkball (Third Clutch, Orificed Third Clutch)

The #11 checkball is located in the case cover. Third clutch pressure seats the checkball, which routes fluid through orifice #31, where the fluid enters the orificed third clutch circuit. Orificed third clutch fluid is also routed to the 2-3 accumulator valve, to the 1-2 & 3-4 accumulator valve, and to the TCC solenoid valve.

2-3 Shift Accumulation

2-3 Accumulator Piston

Orificed third clutch pressure actuates the 2-3 accumulator piston, which cushions the apply of the third clutch. The 2-3 accumulator fluid acts on the spring side of the piston, and the fluid is forced back through its circuit to checkball #10.

#10 Checkball (2-3 Accumulator, Secondary 2-3 Accumulator)

The #10 checkball is located in the case cover. This checkball is unseated by 2-3 accumulator fluid, allowing fluid to enter the secondary 2-3 accumulator circuit. Secondary 2-3 accumulator fluid is then routed to the 2-3 accumulator valve.

2-3 Accumulator Valve

Biased by spring force and torque signal on one end, the 2-3 accumulator valve regulates the exhaust of 2-3 accumulator fluid during a 2-3 shift.

Third Clutch Exhaust Valve

Orificed third clutch fluid pressure shifts the exhaust valve against spring force. The valve allows orificed third clutch fluid to enter the third clutch circuit, where the fluid applies the third clutch.

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

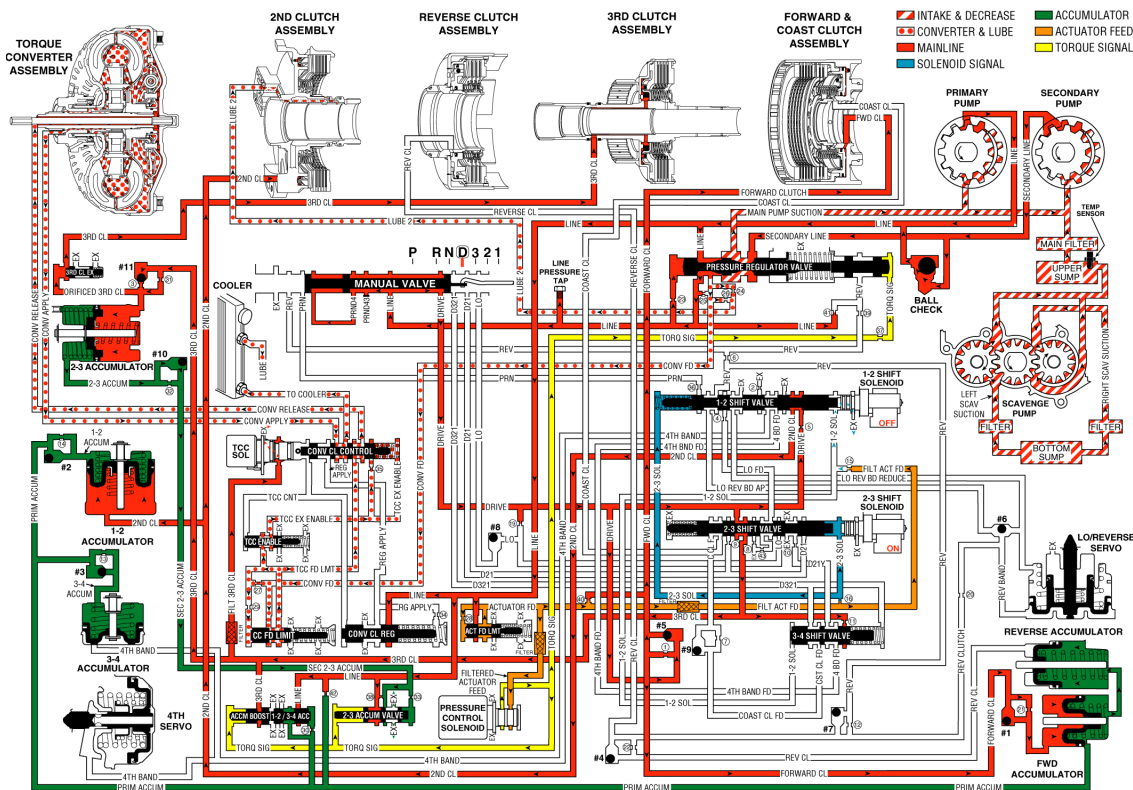


Fig. 336: Overdrive Range, Third Gear Fluid Flow Diagram
Courtesy of GENERAL MOTORS CORP.

OVERDRIVE RANGE, FOURTH GEAR

As the speed of the vehicle continues to increase, the Powertrain Control Module (PCM) monitors the input signals from various engine and transmission sensors. The PCM uses this data to energize the 1-2 shift solenoid (SS) valve in order to shift the transmission into fourth gear at the appropriate time.

Fourth Band Applies

1-2 Shift Solenoid (SS) Valve

The PCM energizes (turns ON) the 1-2 SS valve. The PCM blocks the exhaust of 1-2 SS valve fluid to create high fluid pressure within the valve. High pressure at the 2-3 shift solenoid (SS) valve, at the end of the 1-2 shift valve, holds the valve in the upshifted position, while fluid from the 1-2 SS valve is routed to the end of the 3-4 shift valve.

3-4 Shift Valve

High fluid pressure in the 1-2 SS valve moves the 3-4 shift valve to the upshifted position. The 3-4 shift valve allows orificed third clutch fluid to enter the fourth band feed passage. Fourth band

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

feed is then routed to the 1-2 shift valve.

1-2 Shift Valve

High fluid pressure in 2-3 shift solenoid (SS) valve holds the 1-2 shift valve in the upshifted position. The 1-2 shift valve allows fourth band feed fluid to enter the fourth band circuit. Fourth band fluid is then routed to the 3-4 accumulator piston and to the fourth servo piston.

3-4 Shift Accumulation

3-4 Accumulator Piston

Fourth band fluid actuates the 3-4 accumulator piston. The piston cushions the apply of the fourth band assembly during a 3-4 shift. The 3-4 accumulator fluid on the spring side of the 3-4 accumulator piston is forced back through its circuit to checkball #3.

#3 Checkball (Primary Accumulator, 3-4 Accumulator)

The #3 checkball is located in the accumulator housing. The 3-4 accumulator fluid pressure unseats the checkball. The 3-4 accumulator fluid then enters the primary accumulator circuit and is routed to the 1-2 & 3-4 accumulator valve.

1-2 & 3-4 Accumulator Valve

The 1-2 & 3-4 accumulator valve is biased by torque signal pressure, third clutch pressure, and by orificed primary accumulator fluid pressure. The valve regulates the exhaust rate of primary accumulator fluid during a 3-4 shift.

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

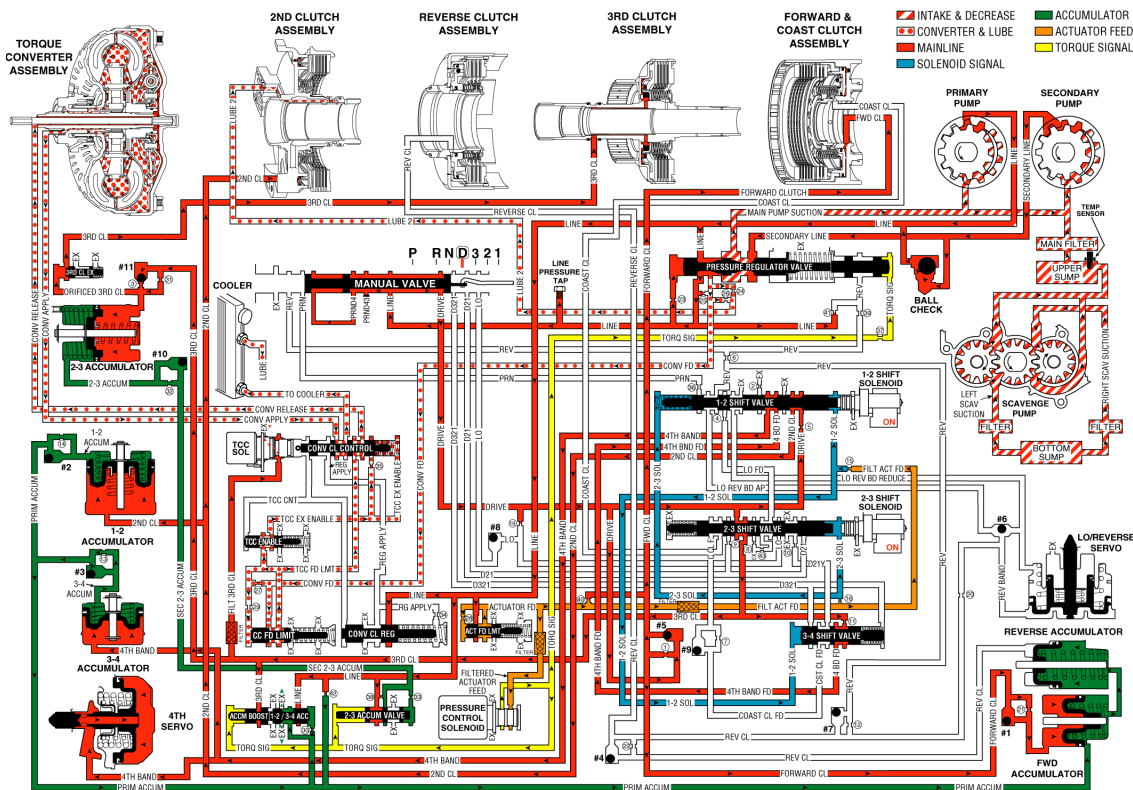


Fig. 337: Overdrive Range, Fourth Gear Fluid Flow Diagram
Courtesy of GENERAL MOTORS CORP.

OVERDRIVE RANGE, FOURTH GEAR - TORQUE CONVERTER CLUTCH APPLIED

The torque converter clutch applies during fourth gear operation after the Transmission Control Module (TCM) receives the appropriate input signals to energize the torque converter clutch (TCC) solenoid. To apply the torque converter clutch, the following changes take place in the electrical and hydraulic systems:

Torque Converter Clutch (TCC) Solenoid

When the TCC solenoid is energized (turned ON), this three-port, pulse width modulation (PWM) solenoid operates on a negative duty cycle at a fixed frequency of 32 Hz. The PCM controls the duty cycle (on time verses off time) based on vehicle operating conditions to enable a smooth apply of the torque converter clutch. Filtered third clutch fluid acts on one end of the solenoid. This forces the converter clutch control valve to shift against the opposing force of the spring.

Converter Clutch Control Valve

When filtered third clutch fluid acts on the end of the converter clutch control valve, the valve is shifted. Filtered third clutch fluid enters the TCC control circuit. However, the PWM action of

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

the TCC solenoid controls the fluid pressure entering the TCC control fluid passage from the third clutch. TCC control fluid pressure is then routed to the converter clutch regulating valve and to the TCC enable valve.

Converter Clutch Regulating Valve

The converter clutch regulating valve is biased by TCC control fluid pressure, by spring force, and by orificed apply fluid. The valve regulates line pressure entering the regulated apply circuit. Regulated apply fluid is routed to the converter clutch control valve and through orifice #34, where the fluid enters the orificed apply fluid passage. Orifice apply fluid is then routed to the spring side of the converter clutch regulating valve.

Converter Clutch Control Valve

When the valve is shifted against spring force, regulated apply fluid (from the converter clutch regulating valve) enters the converter apply circuit. Converter apply fluid is then routed to the apply side of the torque converter pressure plate. TCC feed limit fluid, previously feeding into the converter release circuit, passes through the valve and enters the circuit which directs the fluid to the cooler.

TCC Enable Valve

When shifted by TCC control fluid pressure against spring force, the TCC enable valve prevents the TCC feed limit from entering the orificed TCC exhaust enable passage.

IMPORTANT: After the transmission is operating with the torque converter clutch applied, the cooler and the lubrication circuits function in the same manner as previously explained. Refer to Reverse. Release fluid is then exhausted through the TCC enable valve.

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

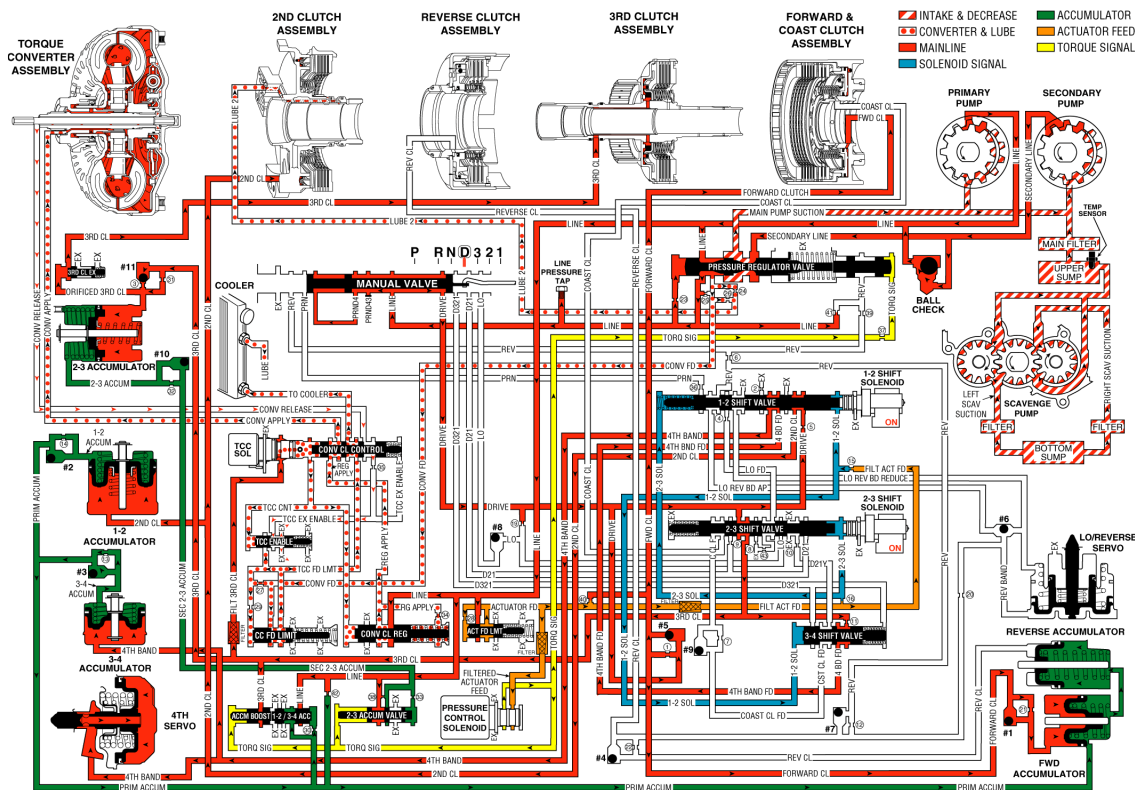


Fig. 338: Overdrive Range, Fourth Gear - TCC Applied Fluid Flow Diagram
Courtesy of GENERAL MOTORS CORP.

OVERDRIVE RANGE, 4-3 DOWNSHIFT

When the transmission is operating in Fourth gear, a 4-3 downshift occurs if there is a significant change or increase in the throttle position, or if the load on the engine is increased. The torque converter clutch releases prior to the downshift occurring, which results in the following changes in the hydraulic system:

Line Pressure Increases

Pressure Control (PC) Solenoid Valve

The change in throttle position (increase in percentage of travel) signals the PCM to increase the PC solenoid valve's OFF cycle time. When this occurs, higher filtered actuator feed pressure passes through the PC solenoid valve into the torque signal fluid passage.

Pressure Regulator Valve

Torque signal fluid, acting on the end of the valve, causes the valve to move against orificed line pressure at the other end of the valve. This movement of the valve increases line pressure in the hydraulic circuits.

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Actuator Feed Limit Valve

Increased line pressure passes through the valve and the pressure enters the actuator feed circuit. Actuator feed fluid is routed through the force motor feed filter and then the fluid is routed into the filtered actuator feed circuit. Filtered actuator feed is then sent to the PC solenoid valve.

Torque Converter Clutch Releases

Torque Converter Clutch (TCC) Solenoid

As the throttle position changes, the throttle position sensor provides input to the PCM indicating throttle angle. The PCM then lowers the ON/OFF cycle time. Then the PCM de-energizes the TCC solenoid, thereby letting the filtered third clutch fluid exhaust through the solenoid. With filtered third clutch fluid exhausting, the converter clutch control valve moves into the released position.

Converter Clutch Control Valve

When spring force moves the converter clutch control valve to the released position, the valve directs TCC feed limit fluid into the converter release circuit. Converter release fluid is then routed to the torque converter pressure plate and disengages the torque converter clutch. Converter apply fluid from the torque converter clutch pressure plate is then routed back through its circuit to the converter clutch control valve. Converter apply fluid passes through the valve and enters the cooler circuit.

Fourth Band Releases

1-2 Shift Solenoid (SS) Valve

The 1-2 SS valve de-energizes, allowing fluid pressure from the 1-2 SS valve (acting on the end of the 3-4 shift valve) to exhaust through the solenoid. With low fluid pressure in the 1-2 SS valve, spring force acting on the opposite end of the valve moves the 3-4 shift valve.

Fourth Servo Assembly

Spring force actuates the fourth servo piston and returns the piston to its band released position. This movement forces fourth band fluid from the other side of the piston back through its circuit to the 1-2 shift valve.

1-2 Shift Valve

Spring force and pressure from the 2-3 shift solenoid (SS) valve hold the 1-2 shift valve in the upshifted position. Fourth band fluid is routed back through the valve and into the fourth band feed circuit. Fourth band feed is then routed to the 3-4 shift valve.

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

3-4 Shift Valve

Spring force holds the 3-4 shift valve in the downshifted position. Fourth band fluid from the 1-2 shift valve is routed through the valve into the orificed D21Y fluid passage. Orificed D21Y fluid is then routed to the 2-3 shift valve where the fluid exhausts.

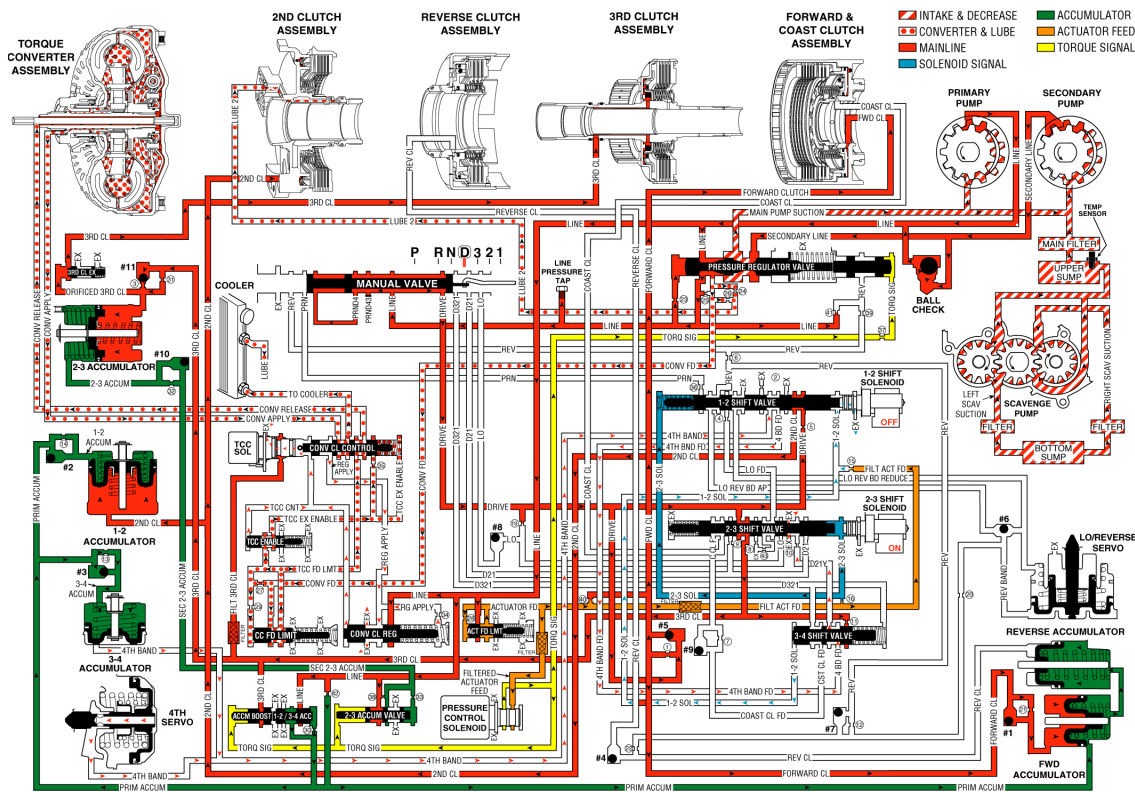


Fig. 339: Overdrive Range, 4-3 Downshift Fluid Flow Diagram
Courtesy of GENERAL MOTORS CORP.

MANUAL THIRD GEAR

When the gear selector lever is moved to the Drive Range (3) position, the manual valve also moves. This allows line pressure to enter the D321 fluid circuit. The torque converter clutch releases in the same manner as previously described. Refer to **Overdrive Range, Fourth Gear - Torque Converter Clutch Applied**, but the torque converter clutch may reapply when the appropriate operating conditions of the vehicle have been met.

Coast Clutch Applies

Manual Valve

Mechanically moved through the gear selection, the manual valve allows line pressure to enter the D321 fluid circuit, and the PRDN4 fluid exhausts at the valve. D321 fluid is then routed to the

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

spring end of the 3-4 shift valve.

3-4 Shift Valve

Spring force and D321 fluid pressure hold the 3-4 shift valve in the downshifted position. The 3-4 shift valve allows D321 fluid to pass through the valve and enter the coast clutch feed circuit. Coast clutch feed is then routed to checkball #9.

#9 Checkball (Coast Clutch Feed, Orificed Coast Clutch Feed)

The #9 checkball is located in the valve body, and the checkball is unseated by coast clutch feed. The checkball routes fluid through orifice #7, where the fluid enters the coast clutch circuit. Coast clutch fluid is then routed to the 2-3 shift valve.

2-3 Shift Valve

High fluid pressure at the 2-3 shift solenoid (SS) valve holds the 2-3 shift valve in the upshifted position. This allows coast clutch fluid to pass through the valve. Coast clutch fluid is then routed to the coast clutch piston and applies the clutch.

Fourth Band Releases

1-2 Shift Solenoid (SS) Valve

The 1-2 SS valve de-energizes (turns OFF), allowing the 1-2 SS valve fluid pressure (acting on the end of the 3-4 shift valve) to exhaust through the solenoid. Low fluid pressure acts on the solenoid valve fluid circuit. Spring force, acting on the opposite end of the valve, forces the 3-4 shift valve to move.

Fourth Servo Assembly

Spring force actuates the fourth servo piston. This force returns the piston to its band released position. This movement forces fourth band fluid from the other side of the piston. The fluid is forced back through its circuit to the 1-2 shift valve.

1-2 Shift Valve

Spring force and pressure from the 2-3 shift solenoid (SS) valve hold the 1-2 shift valve in the upshifted position. The fourth band fluid is routed back through the valve and into the fourth band feed circuit. Fourth band feed is then routed to the 3-4 shift valve.

3-4 Shift Valve

Spring force and D321 fluid hold the 3-4 shift valve in the downshifted position. Fourth band

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

fluid from the 1-2 shift valve is routed through the valve into the orificed D21Y fluid passage. Orificed D21Y fluid is then routed through the 2-3 shift valve, where the fluid exhausts.

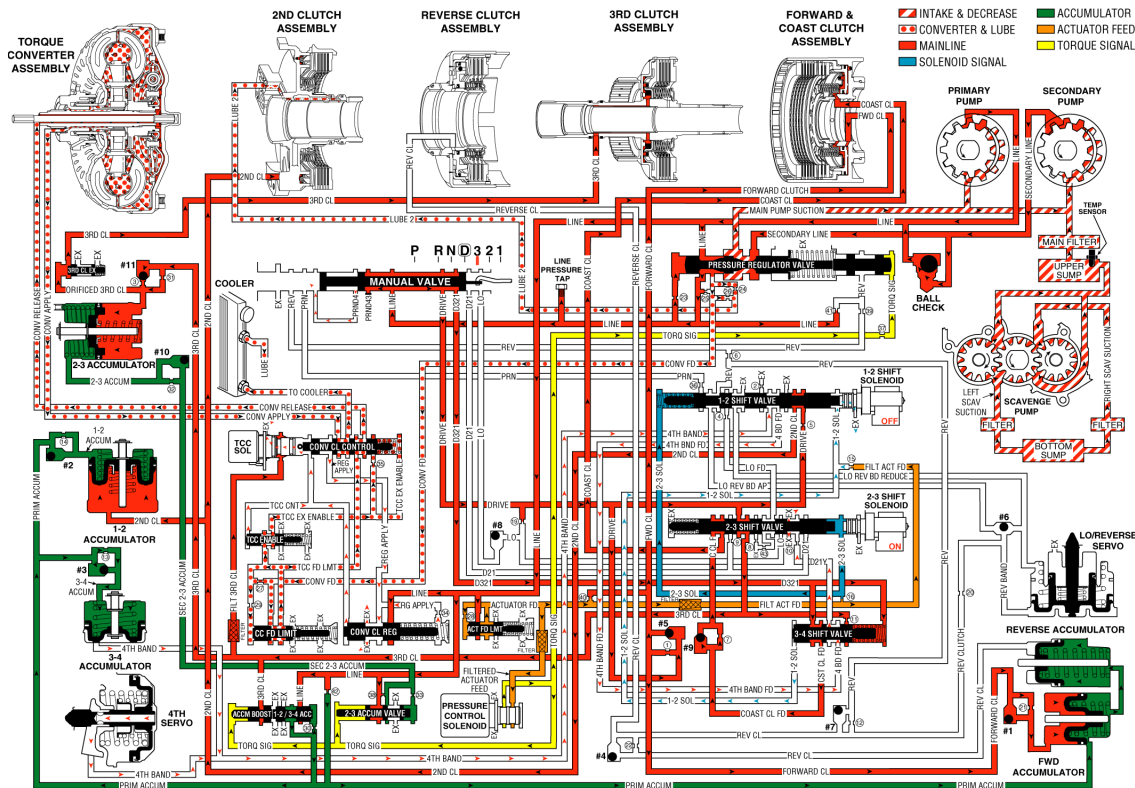


Fig. 340: Manual Third Gear Fluid Flow Diagram
Courtesy of GENERAL MOTORS CORP.

MANUAL SECOND GEAR

When the gear selector lever is moved to the Manual Second (D2) gear range, the manual valve moves and allows line pressure to enter the D21 fluid passage. The transmission reacts by shifting immediately into second gear range. The transmission is prevented from upshifting into either Third or Fourth gear.

Fourth Band Applies

Manual Valve

Line pressure at the valve enters the D21 fluid circuit which is then routed to the 2-3 shift valve.

2-3 Shift Solenoid (SS) Valve

The 2-3 SS valve de-energizes (turns OFF) in order to allow fluid from the 2-3 SS valve to exhaust through the solenoid. In the absence of 2-3 SS valve fluid pressure at the 2-3 shift valve,

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

spring force acting on the end of the valve moves the valve into the downshifted position.

2-3 Shift Valve

Spring force hold the 2-3 shift valve in the downshifted position. D21 fluid passes through the valve and orifice #10, where the fluid enters the orificed D21Y circuit. Orificed D21Y fluid is then routed to the 3-4 shift valve. D21 fluid also passes through orifice #9, where the fluid enters the coast clutch circuit, and the fluid is routed to the 3-4 shift valve. Coast clutch fluid is then directed to the coast clutch piston, and the fluid applies the clutch.

3-4 Shift Valve

Spring force and D321 fluid hold the 3-4 shift valve in the downshifted position. The 3-4 shift valve allows orificed D21Y fluid to enter the fourth band feed circuit. Fourth band feed is then routed to the 1-2 shift valve.

1-2 Shift Valve

Spring force holds the 1-2 shift valve in the upshifted position. The 1-2 shift valve allows fourth band feed fluid to enter the fourth band circuit.

3-4 Accumulator Assembly

Fourth band fluid is routed to the 3-4 accumulator piston. The fluid actuates the piston during the apply of the fourth band assembly.

Third Clutch Releases

2-3 Shift Valve

Spring force holds the 2-3 shift valve in the downshifted position. The 2-3 shift valve prevents drive fluid from entering the third clutch circuit. In the absence of hydraulic pressure in the third clutch circuit, spring force moves the third clutch exhaust valve.

Third Clutch Exhaust Valve

Spring force holds the third clutch exhaust valve in the downshifted position. The valve allows third clutch fluid from the third clutch piston to exhaust through the valve. Orificed third clutch fluid from the valve is routed back through orifice #3 to checkball #11.

#11 Checkball (Third Clutch, Orificed Third Clutch)

The #11 checkball is located in the case cover. This checkball is unseated by orificed third clutch fluid. This allows fluid to enter the third clutch fluid circuit.

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

2-3 Accumulator

Orificed third clutch fluid from the accumulator piston passes through orifice #31, and the fluid enters the third clutch circuit. Third clutch fluid is then routed to the 2-3 shift valve and to the TCC solenoid valve, where the fluid exhausts.

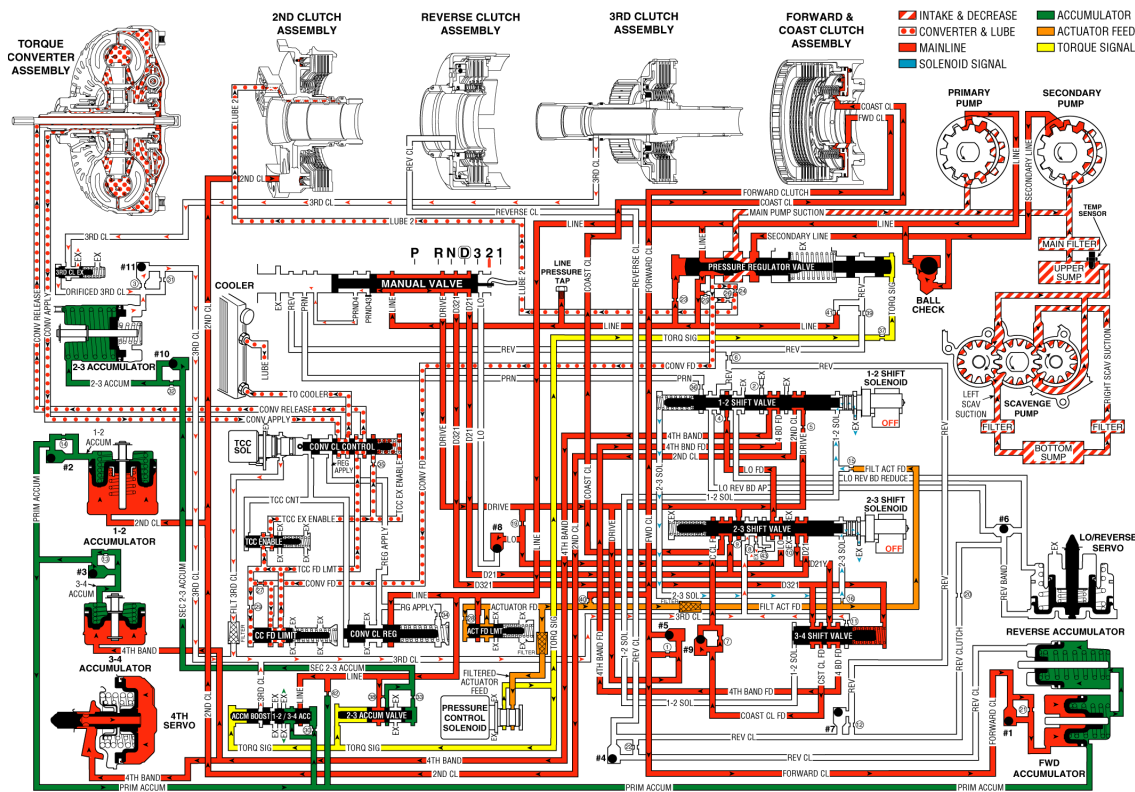


Fig. 341: Manual Second Gear Fluid Flow Diagram
Courtesy of GENERAL MOTORS CORP.

MANUAL FIRST GEAR

When the gear selector lever is moved to the Manual First (1) gear range, the manual valve moves and allows line pressure to enter the Low fluid passage. If the vehicle is operating below 56 km/h (35 mph), the transmission will shift immediately into first gear. the transmission is prevented from upshifting. During the shift into Manual First gear, the following changes occur within the transmission:

Low & Reverse Band Applies

Manual Valve

Line pressure at the manual valve enters the Low fluid circuit. Line pressure is then routed to checkball #8.

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

#8 Checkball (Low)

Low fluid pressure unseats the #8 checkball, which is located in the valve body. This pressure then routes Low fluid to the 2-3 shift valve.

2-3 Shift Valve

Spring force hold the 2-3 shift valve in the downshifted position. Low fluid passes through the valve and Low fluid enters the Low feed circuit. Low feed passes through orifice #4, and Low feed enters the orificed Low feed circuit. Low feed is then routed to the 1-2 shift valve.

1-2 Shift Solenoid (SS) Valve

When the PCM energizes (turns ON) the 1-2 SS valve, high fluid pressure from the 1-2 SS valve builds at the end of the 1-2 shift valve. This causes the valve to downshift against spring force.

1-2 Shift Valve

Fluid pressure from the 1-2 SS valve holds the 1-2 shift valve in the downshifted position. The valve allows orificed Low feed to pass through the valve and enter the Low & Reverse band reduce circuit. Low & Reverse band reduce is then routed to checkball #6 and to the spring side of the Low & Reverse servo piston.

#6 Checkball (Low Reverse Band Apply and Reduce)

The #6 checkball is located in the valve body. The checkball is unseated by Low & Reverse reduce fluid. This allows fluid to enter the Low & Reverse band apply circuit. Low & Reverse band apply fluid is then routed to the Low & Reverse servo piston where the fluid actuates the piston and applies the Low & Reverse band assembly.

Fourth Band Releases

1-2 Shift Valve

High fluid pressure from the 1-2 shift solenoid (SS) valve holds the 1-2 shift valve in the downshifted position. The valve allows fourth band fluid from the fourth servo and from the 3-4 accumulator piston to pass through the valve. Fourth band fluid then enters an exhaust passage where the fluid is routed through orifice #2 before exiting the circuit.

Second Clutch Releases

1-2 Shift Valve

High 1-2 solenoid fluid pressure holds the 1-2 shift valve in the downshifted position. The valve

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Fig. 342: Manual First Gear Fluid Flow Diagram
Courtesy of GENERAL MOTORS CORP.

FLUID PASSAGES

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

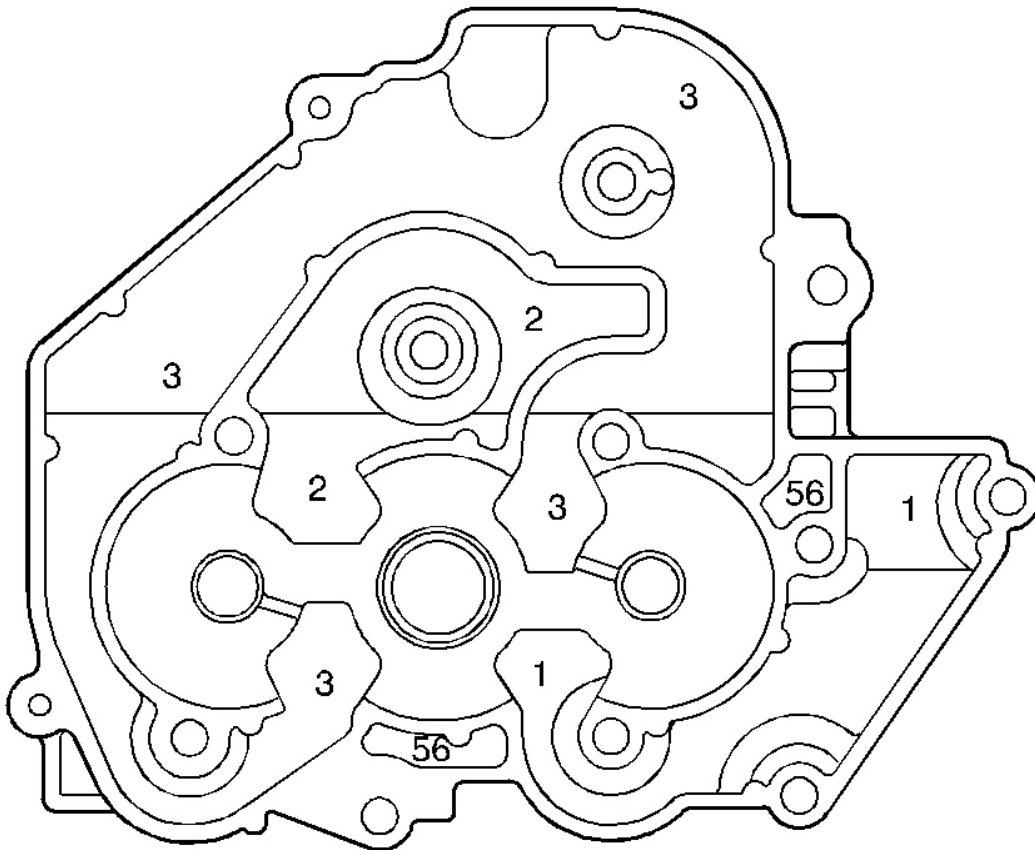


Fig. 343: Scavenge Pump Body Fluid Passages (Scavenge Pump Cover Side)
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 343

Callout	Component Name
1	Left Scavenge Suction
1	Left Scavenge Suction
2	Right Scavenge Suction
2	Right Scavenge Suction
3	Scavenge Outlet
3	Scavenge Outlet
3	Scavenge Outlet
3	Scavenge Outlet
56	Void

56

Void

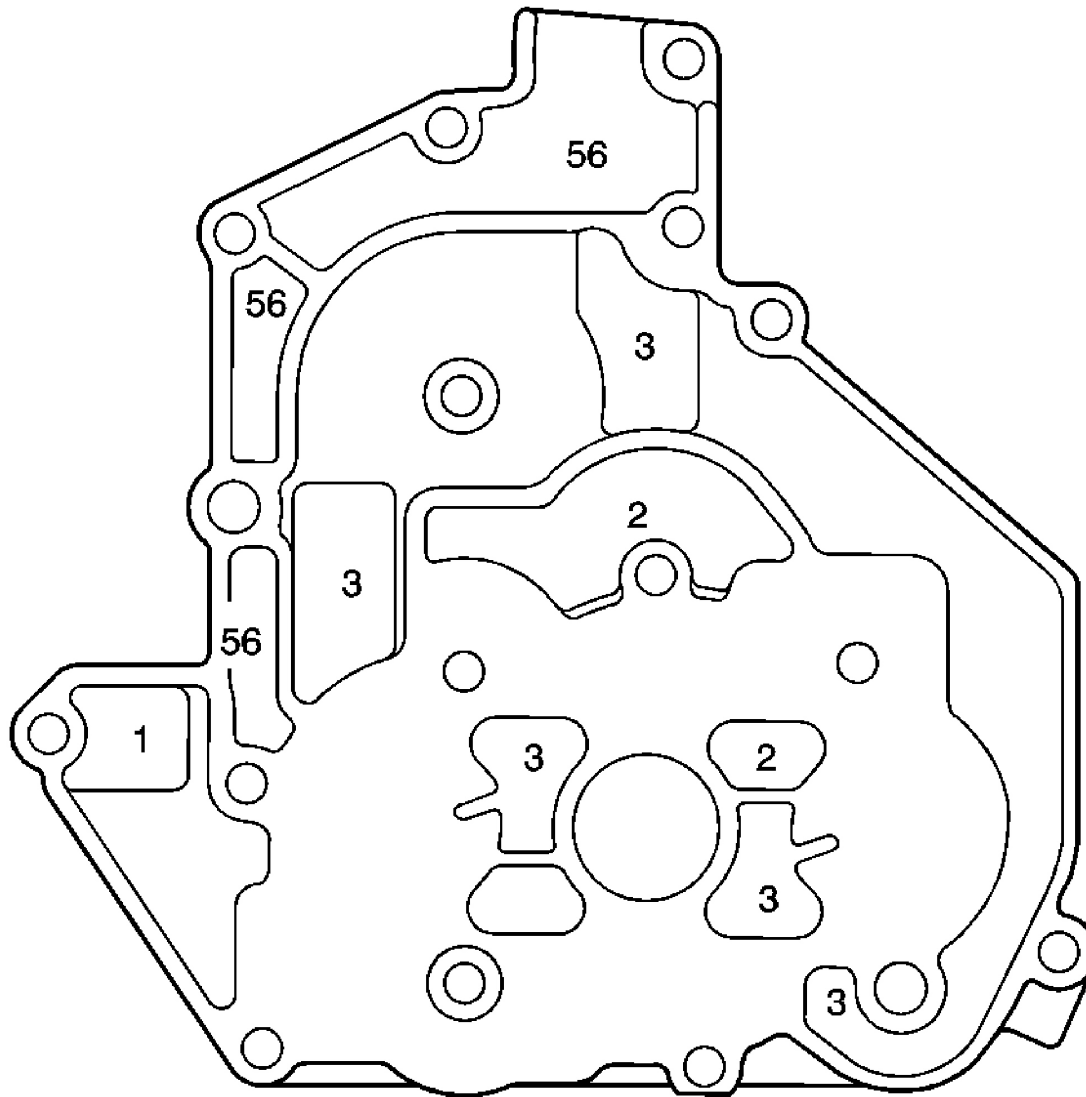


Fig. 344: Scavenge Pump Cover Fluid Passages (Scavenge Pump Body Side)
 Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 344

Callout	Component Name
1	Left Scavenge Suction
2	Right Scavenge Suction
3	Scavenge Outlet
56	Void

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

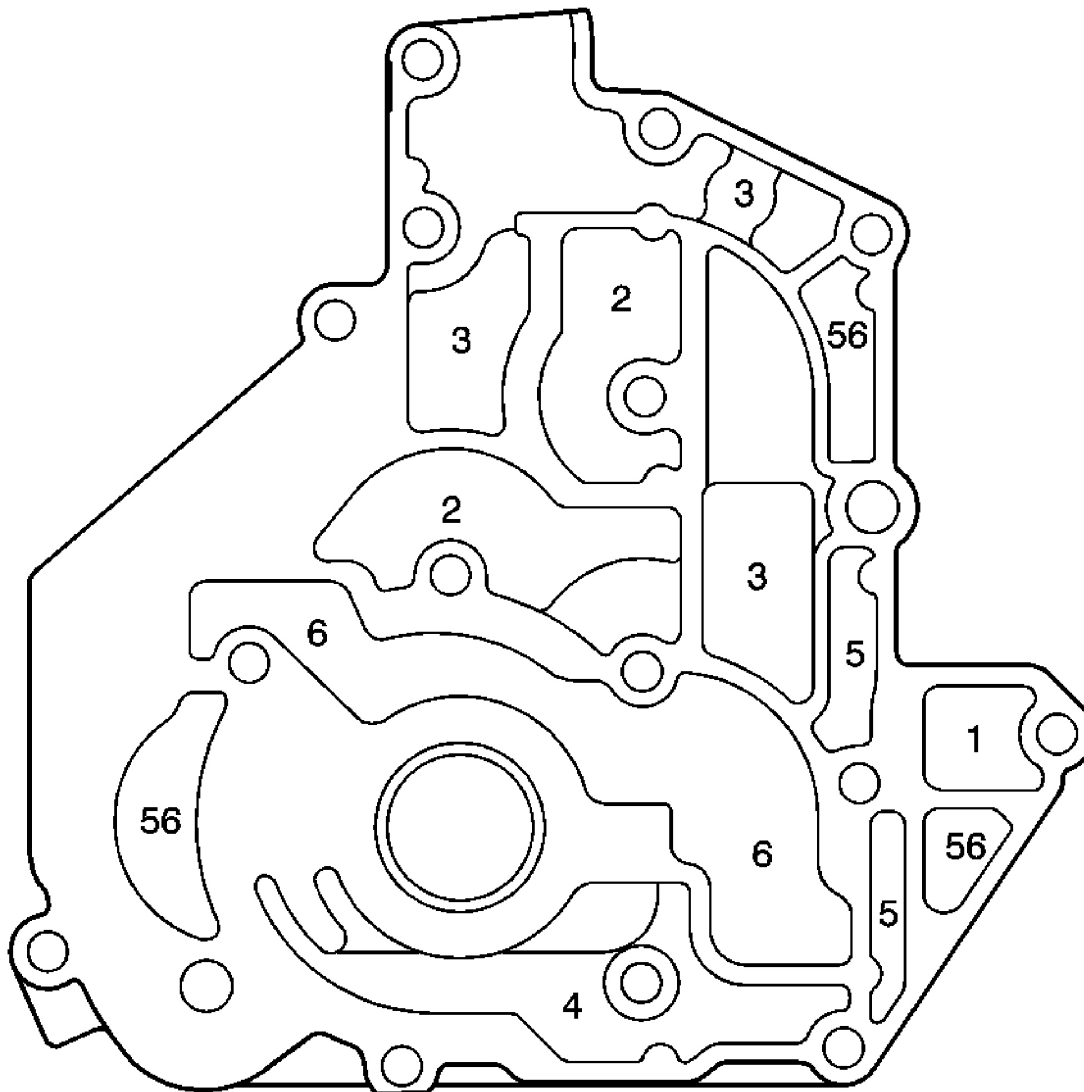


Fig. 345: Scavenge Pump Cover Fluid Passages (Primary Pump Body Side)
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 345

Callout	Component Name
1	Left Scavenge Suction
2	Right Scavenge Suction
2	Right Scavenge Suction
3	Scavenge Outlet
3	Scavenge Outlet
3	Scavenge Outlet

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

4	Main Pump Suction
5	Sump
5	Sump
6	Line
6	Line
56	Void
56	Void
56	Void

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

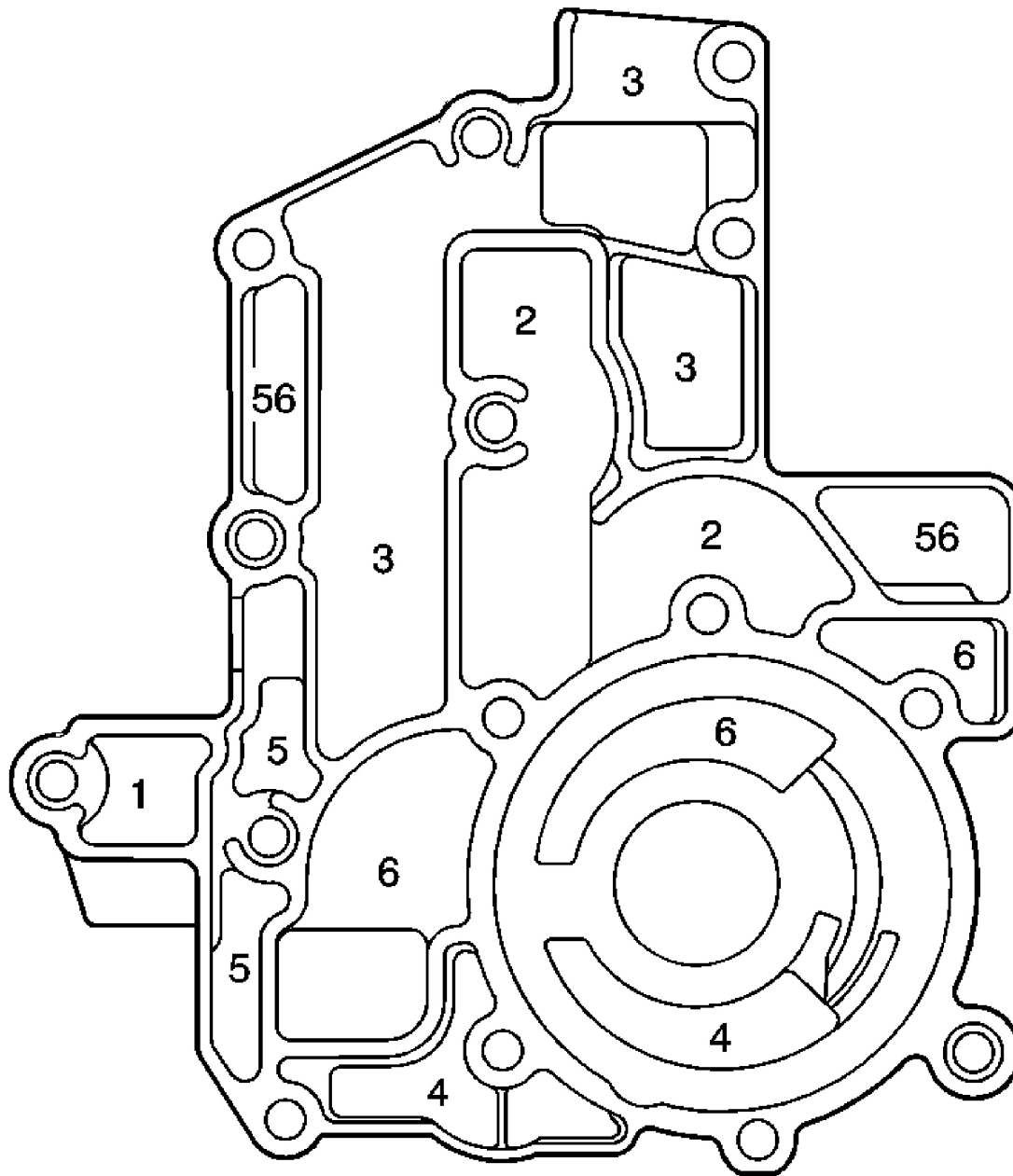


Fig. 346: Primary Pump Body Fluid Passages (Scavenge Pump Cover Side)
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 346

Callout	Component Name
1	Left Scavenge Suction
2	Right Scavenge Suction
3	Scavenge Outlet

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

4	Main Pump Suction
5	Sump
6	Line
56	Void

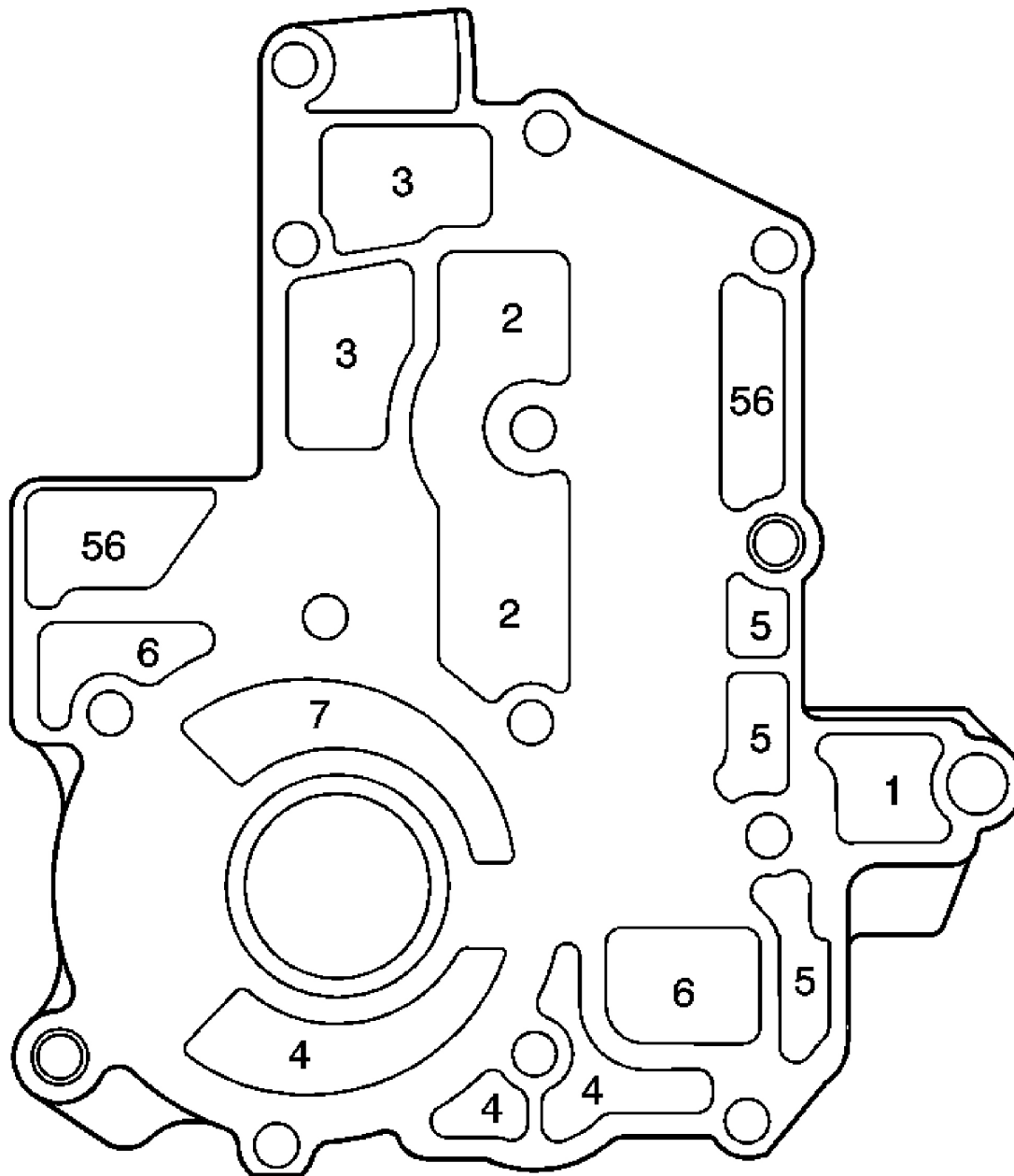


Fig. 347: Primary Pump Body Fluid Passages (Secondary Pump Body Side)
Courtesy of GENERAL MOTORS CORP.

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Callouts For Fig. 347

Callout	Component Name
1	Left Scavenge Suction
2	Right Scavenge Suction
3	Scavenge Outlet
4	Main Pump Suction
5	Sump
6	Line
7	Secondary line
56	Void

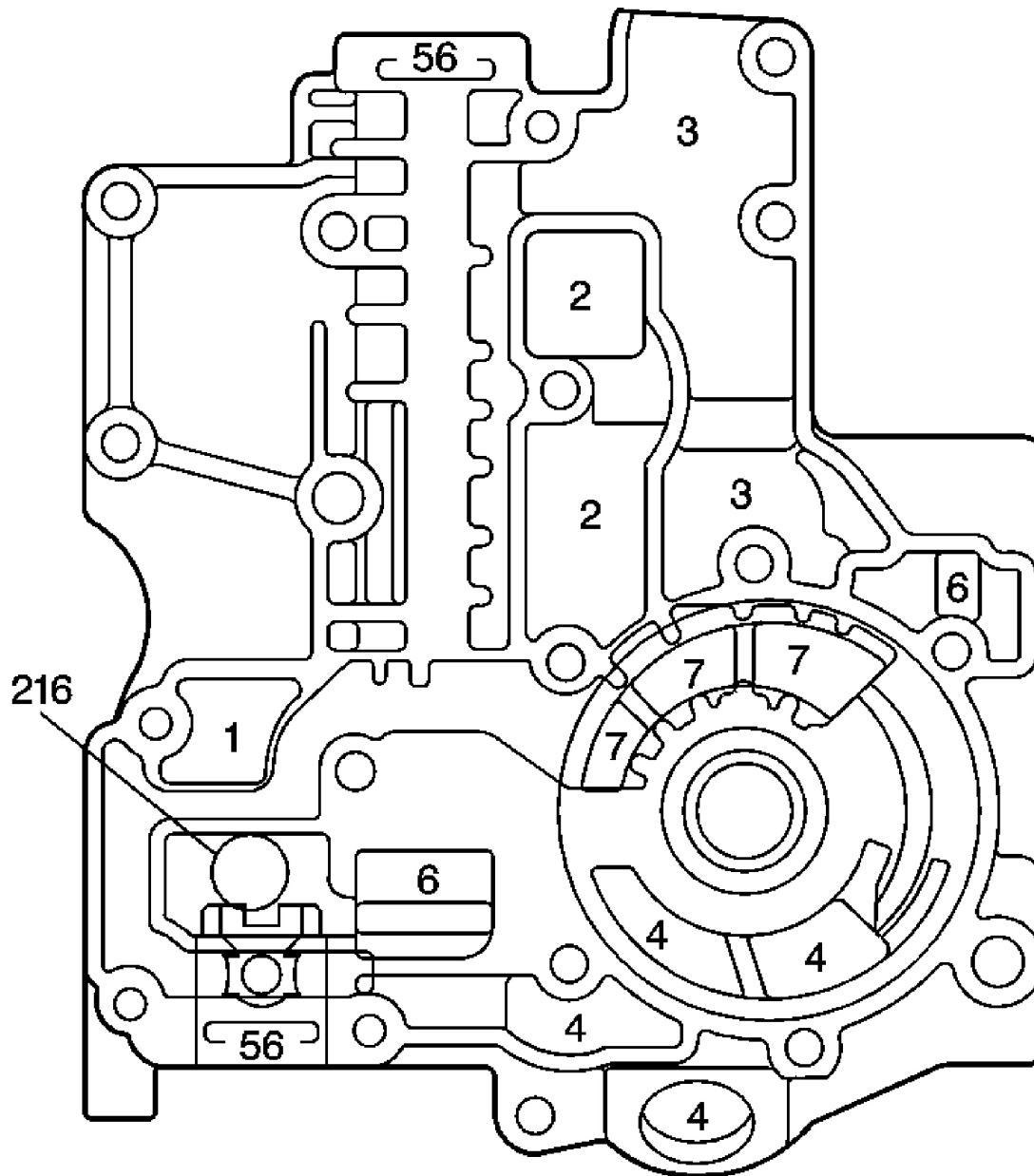


Fig. 348: Secondary Pump Body Fluid Passages (Primary Pump Body Side)
 Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 348

Callout	Component Name
1	Left Scavenge Suction
2	Right Scavenge Suction
3	Scavenge Outlet

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

4	Main Pump Suction
6	Line
7	Secondary Line
56	Void
216	Secondary Pump Cut-Off Ball

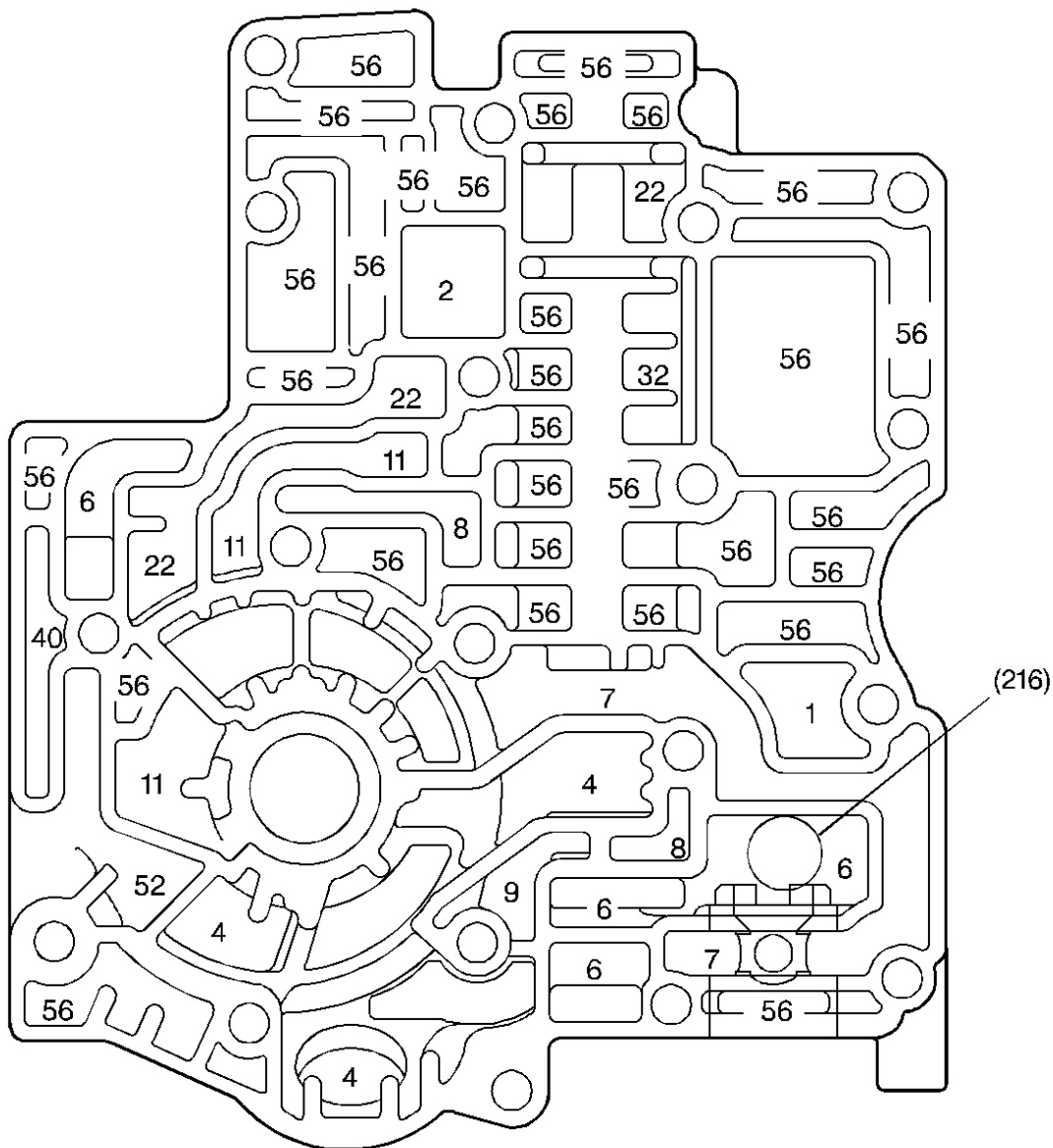


Fig. 349: Secondary Pump Body Fluid Passages (Case Cover Side)
 Courtesy of GENERAL MOTORS CORP.

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Callouts For Fig. 349

Callout	Component Name
216	Secondary Pump Cut-Off Ball
1	Left Scavenge Suction
2	Right Scavenge Suction
4	Main Pump Suction
6	Line
7	Secondary Line
8	Converter Feed
9	Lube 2
11	Converter Release
22	Torque Signal
32	Reverse
40	3rd Clutch
56	Void



Callout	Component Name

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2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

[illegible]

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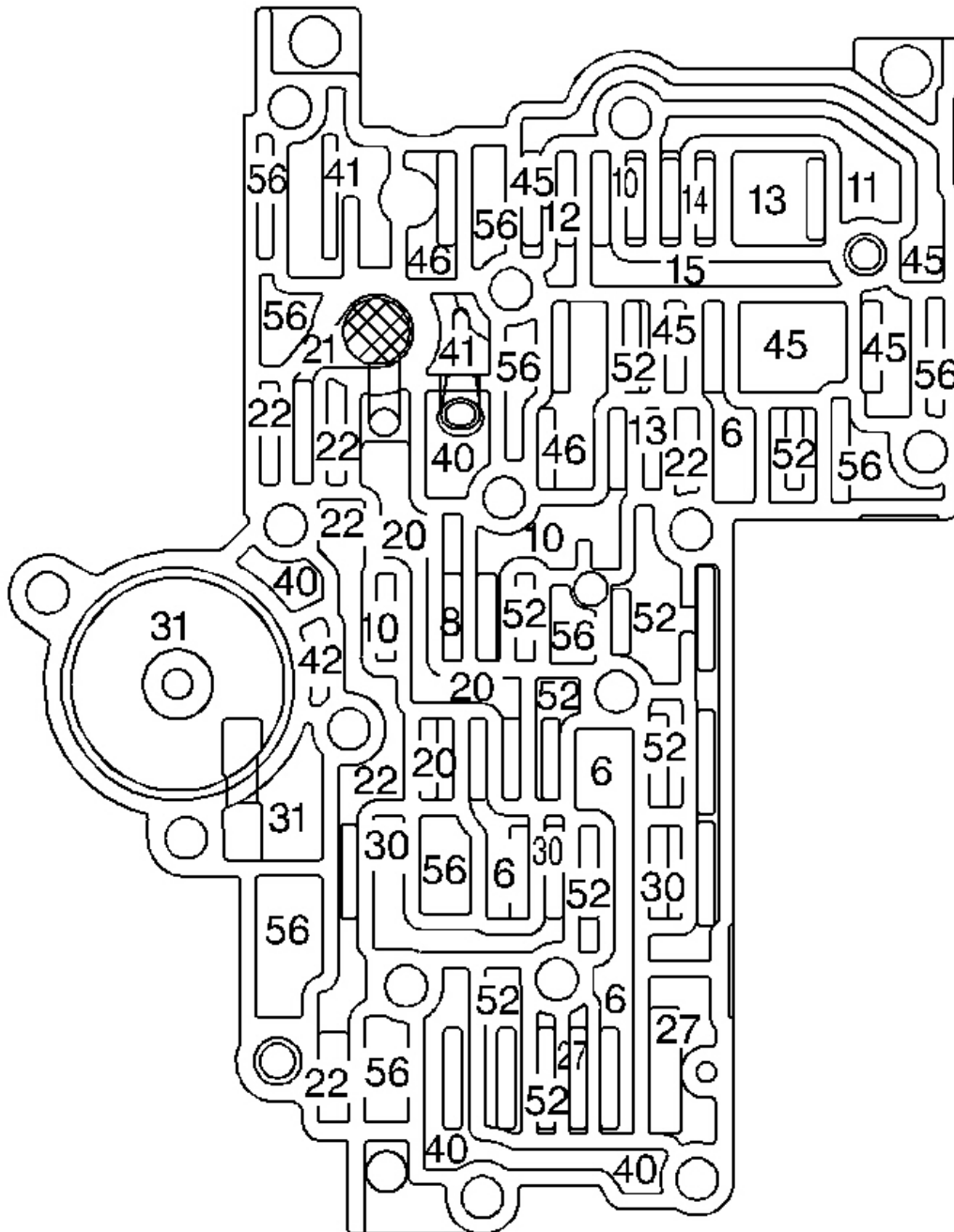


Fig. 351: Upper Control Valve Body Fluid Passages (Case Cover Side)
Courtesy of GENERAL MOTORS CORP.

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2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Callouts For Fig. 351

Callout	Component Name
6	Line
8	Converter Feed
10	TCC Feed Limit
10	TCC Feed Limit
10	TCC Feed Limit
11	Converter Release
12	Converter Apply
13	TCC Exhaust Enable
15	To Cooler
20	Actuator Feed
20	Actuator Feed
21	Filtered Actuator Feed
22	Torque Signal
22	Torque Signal
27	Primary Accumulator
27	Primary Accumulator
30	Secondary 2-3 Accumulator
31	2-3 Accumulator
31	2-3 Accumulator
40	3rd Clutch
40	3rd Clutch
40	3rd Clutch
41	Filtered 3rd Clutch
41	Filtered 3rd Clutch
45	Regulated Apply
45	Regulated Apply
45	Regulated Apply
46	TCC Control
46	TCC Control
52	Exhaust
52	Exhaust
56	Void
56	Void



2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Callouts For Fig. 352

Callout	Component Name
6	Line
8	Converter Feed
10	TCC Feed Limit
11	Converter Release
12	Converter Apply
13	TCC Exhaust Enable
14	Orifice TCC Exhaust Enable
15	To Cooler
20	Actuator Feed
22	Torque Signal
27	Primary Accumulator
29	1-2 Accumulator
30	Secondary 2-3 Accumulator
31	2-3 Accumulator
40	3rd Clutch
41	Filtered 3rd Clutch
42	Orificed 3rd Clutch
45	Regulated Apply
46	TCC Control

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

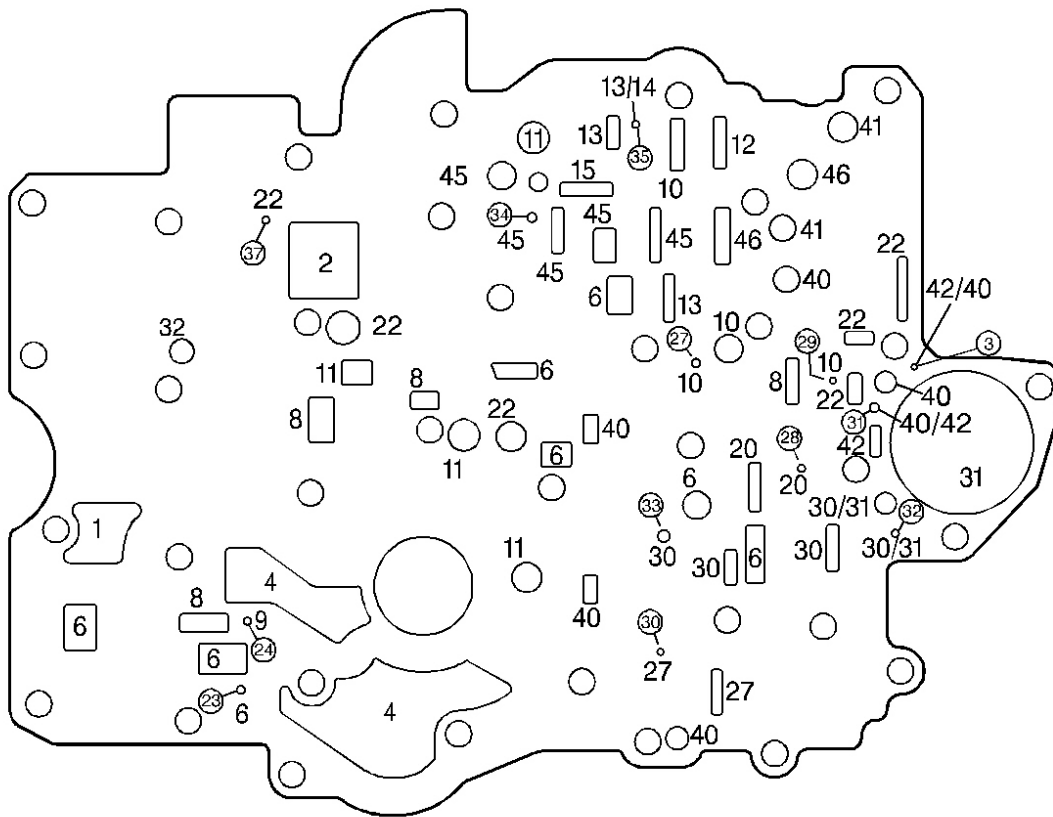


Fig. 353: Spacer Plate Fluid Passages (Secondary Pump Body and Upper Control Valve Body to Case Cover)

Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 353

Callout	Component Name
1	Left Scavenge Suction
2	Right Scavenge Suction
4	Main Pump Suction
4	Main Pump Suction
9	Lube 2
10	TCC Feed Limit
11	Converter Release
12	Converter Apply
13	TCC Exhaust Enable
14	Orifice TCC Exhaust Enable

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

15	To Cooler
27	Primary Accumulator
30	Secondary 2-3 Accumulator
31	2-3 Accumulator
31	2-3 Accumulator
32	Reverse
41	Filtered 3rd Clutch
42	Orificed 3rd Clutch
45	Regulated Apply
46	TCC Control

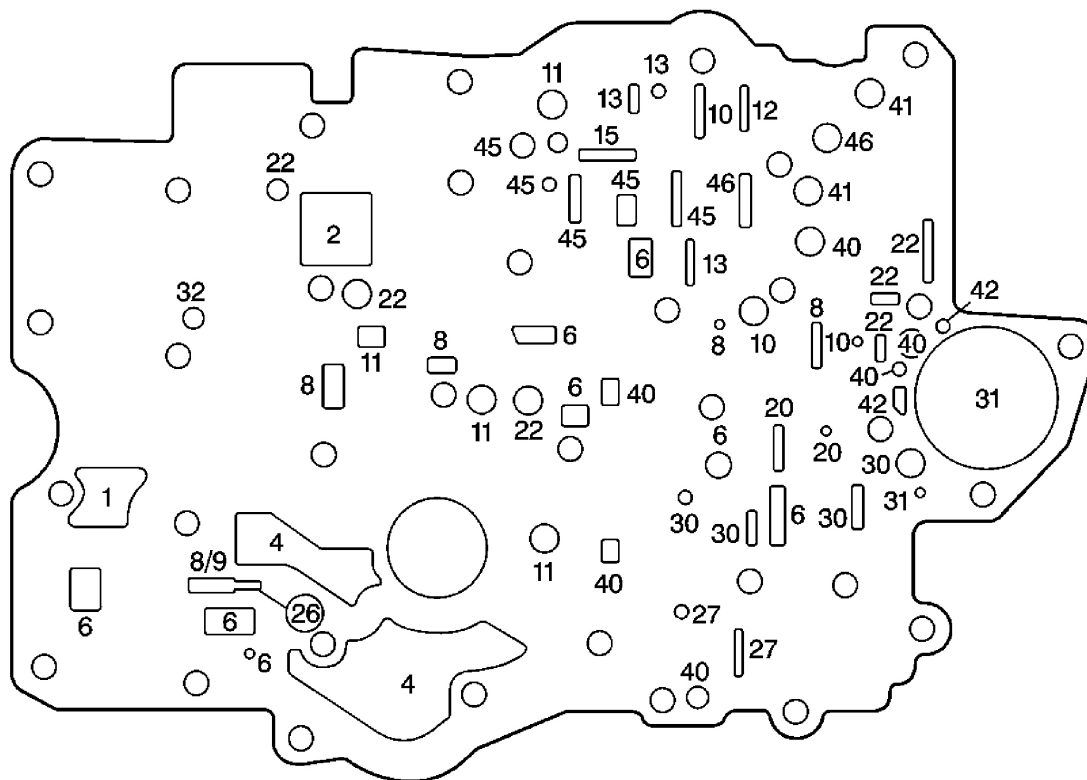


Fig. 354: Gasket Fluid Passages (Spacer Plate to Case Cover)
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 354

Callout	Component Name
1	Left Scavenge Suction
1	Left Scavenge Suction

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

2	Right Scavenge Suction
4	Main Pump Suction
4	Main Pump Suction
6	Line
6	Line
6	Line
6	Line
6	Line
6	Line
6	Line
6	Line
6	Line
6	Line
6	Line
8	Converter Feed
8	Converter Feed
8	Converter Feed
8	Converter Feed
8	Converter Feed
8	Converter Feed
9	Lube 2
9	Lube 2
10	TCC Feed Limit
10	TCC Feed Limit
10	TCC Feed Limit
11	Converter Release
11	Converter Release
11	Converter Release
11	Converter Release
12	Converter Apply
13	TCC Exhaust Enable
13	TCC Exhaust Enable
13	TCC Exhaust Enable
15	To Cooler
20	Actuator Feed
20	Actuator Feed

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

	Torque Signal
22	Torque Signal
22	Torque Signal
22	Torque Signal
22	Torque Signal
22	Torque Signal
27	Primary Accumulator
27	Primary Accumulator
30	Secondary 2-3 Accumulator
30	Secondary 2-3 Accumulator
30	Secondary 2-3 Accumulator
30	Secondary 2-3 Accumulator
31	2-3 Accumulator
31	2-3 Accumulator
32	Reverse
32	Reverse
40	3rd Clutch
40	3rd Clutch
40	3rd Clutch
40	3rd Clutch
40	3rd Clutch
40	3rd Clutch
41	Filtered 3rd Clutch
41	Filtered 3rd Clutch
42	Orificed 3rd Clutch
42	Orificed 3rd Clutch
45	Regulated Apply
45	Regulated Apply
45	Regulated Apply
45	Regulated Apply
45	Regulated Apply
46	TCC Control
46	TCC Control
46	TCC Control

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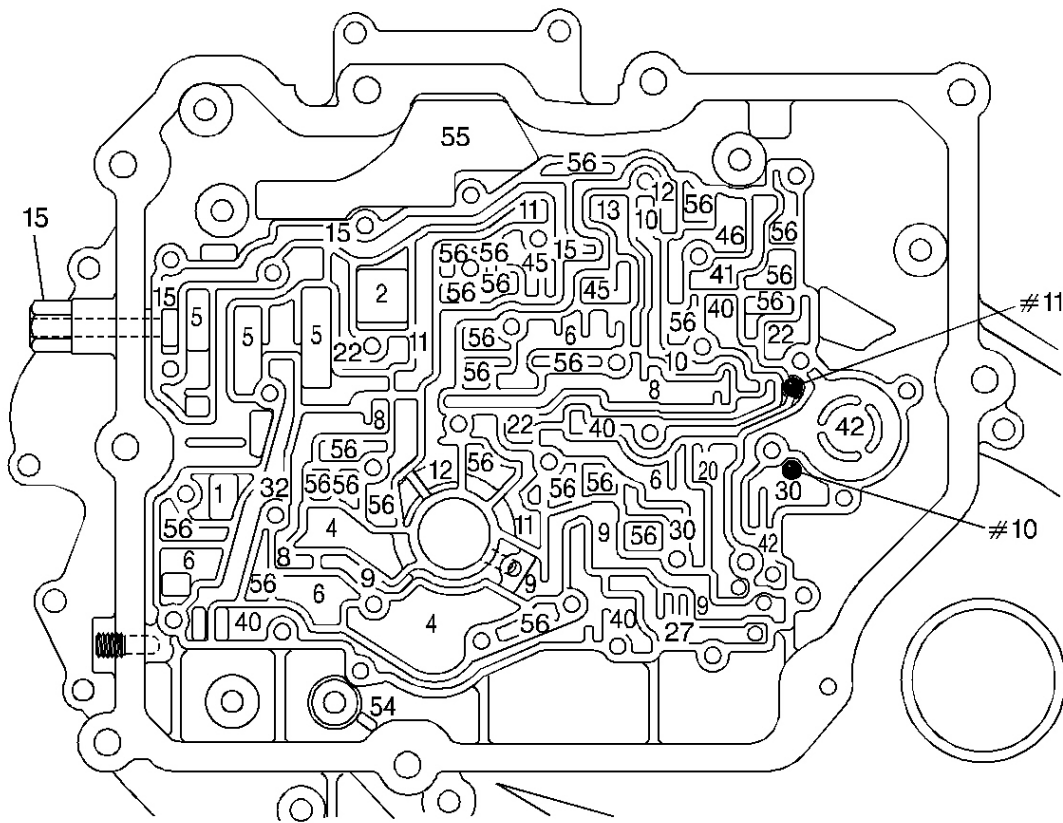


Fig. 355: Case Cover Fluid Passages (Secondary Pump Body and Upper Control Valve Body Side)

Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 355

Callout	Component Name
1	Left Scavenge Suction
2	Right Scavenge Suction
4	Main Pump Suction
5	Sump
5	Sump
8	Converter Feed
9	Lube 2
10	TCC Feed Limit
11	Converter Release
11	Converter Release

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

12	Converter Apply
13	TCC Exhaust Enable
15	To Cooler
20	Actuator Feed
22	Torque Signal
30	Secondary 2-3 Accumulator
32	Reverse
40	3rd Clutch
41	Filtered 3rd Clutch
42	Orificed 3rd Clutch
45	Regulated Apply
46	TCC Control
55	Overflow
56	Void
56	Void
56	Void

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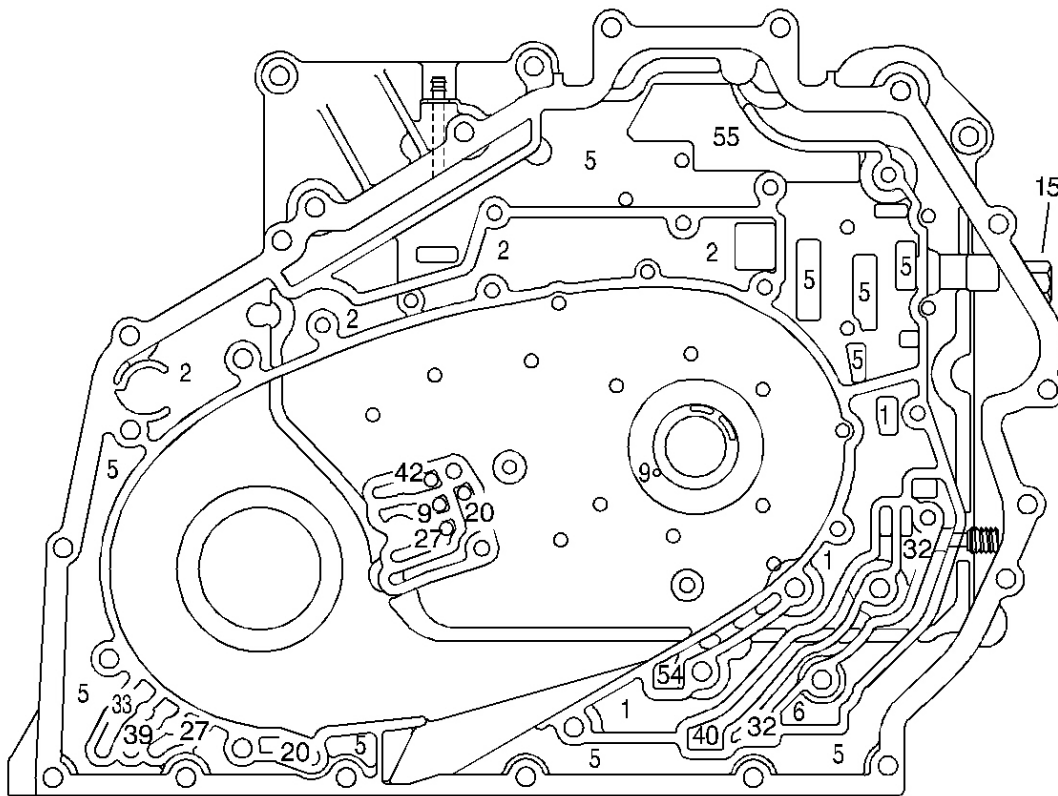


Fig. 356: Case Cover Fluid Passages (Case Side)
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 356

Callout	Component Name
1	Left Scavenge Suction
1	Left Scavenge Suction
2	Right Scavenge Suction
2	Right Scavenge Suction
5	Sump
5	Sump
5	Sump
5	Sump
6	Line
9	Lube 2
9	Lube 2

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

15	To Cooler
20	Actuator Feed
20	Actuator Feed
27	Primary Accumulator
27	Primary Accumulator
32	Reverse
32	Reverse
33	Reverse Clutch
39	2nd Clutch
40	3rd Clutch
42	Orificed 3rd Clutch
54	Drain
55	Overflow

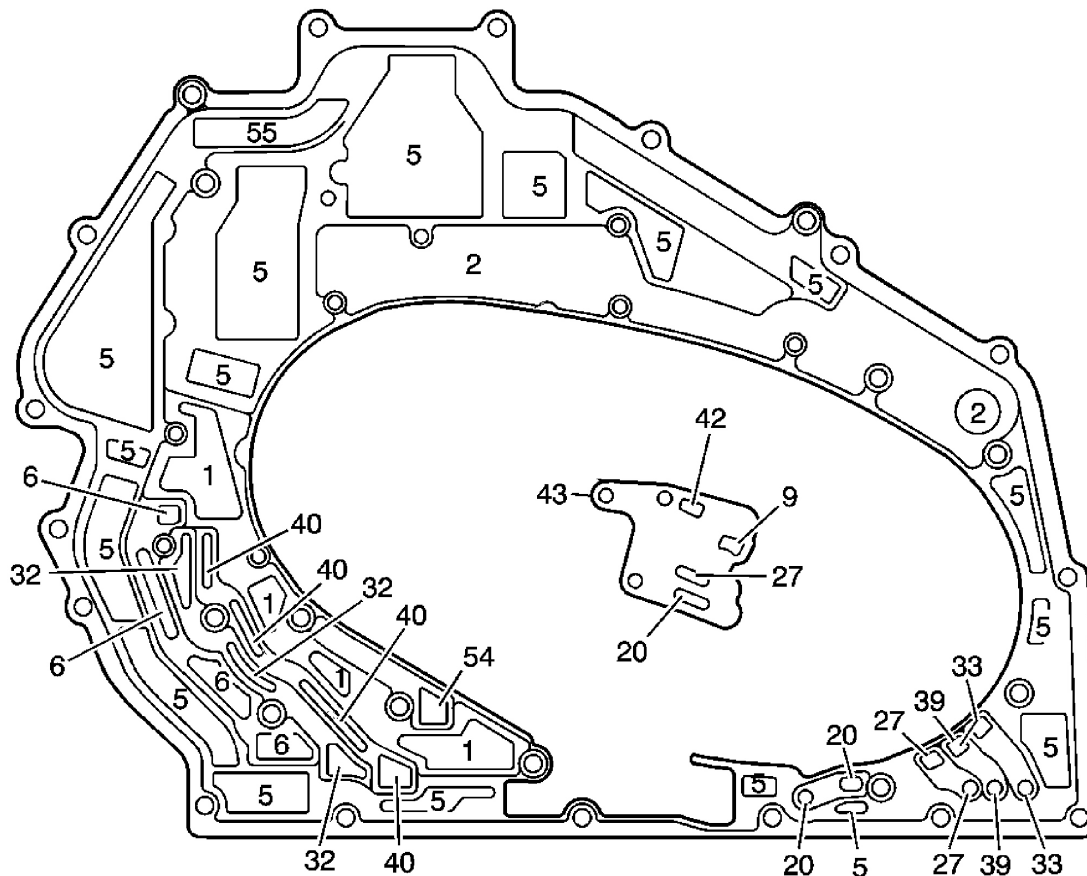


Fig. 357: Seal Fluid Passages (Case Cover to Case and Driven Sprocket Support)

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

Courtesy of GENERAL MOTORS CORP.**Callouts For Fig. 357**

Callout	Component Name
1	Left Scavenge Suction
1	Left Scavenge Suction
1	Left Scavenge Suction
1	Left Scavenge Suction
2	Right Scavenge Suction
2	Right Scavenge Suction
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
6	Line
6	Line
6	Line
6	Line
9	Lube 2
20	Actuator Feed
20	Actuator Feed
20	Actuator Feed
27	Primary Accumulator

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

27	Primary Accumulator
27	Primary Accumulator
32	Reverse
32	Reverse
32	Reverse
33	Reverse Clutch
33	Reverse Clutch
39	2nd Clutch
39	2nd Clutch
40	3rd Clutch
40	3rd Clutch
40	3rd Clutch
40	3rd Clutch
42	Orificed 3rd Clutch
43	4th Band Feed
54	Drain
55	Void

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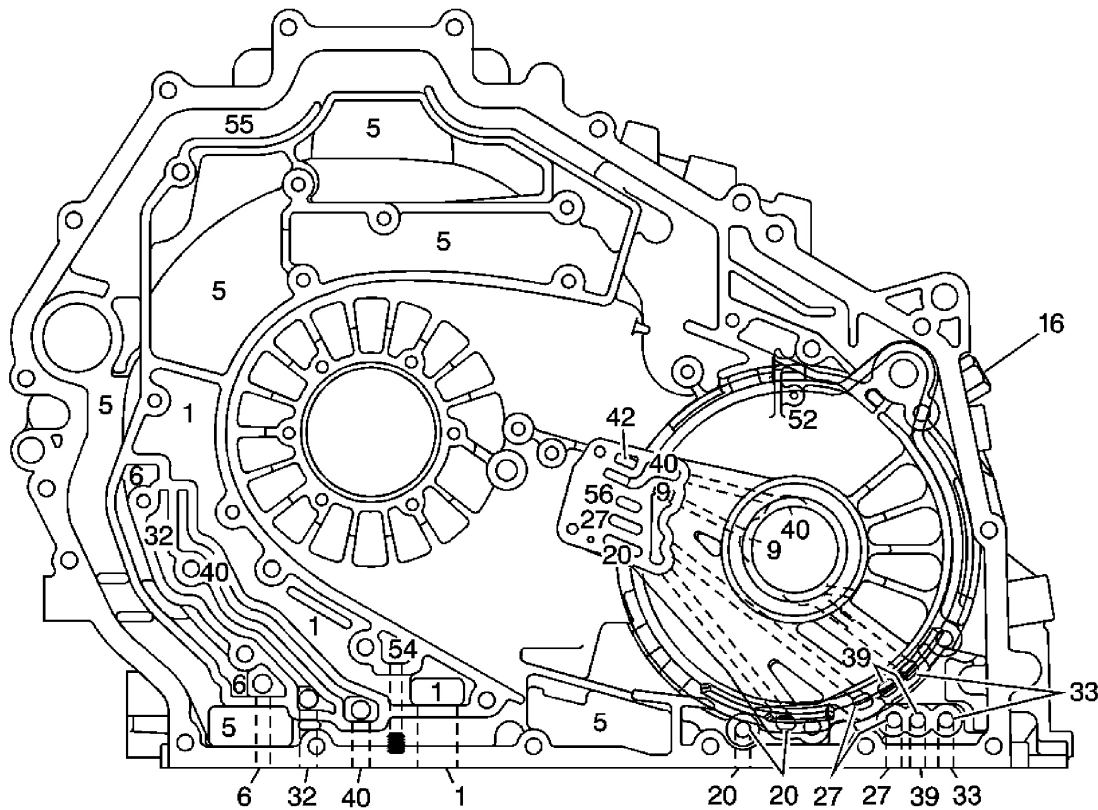


Fig. 358: Case and Driven Sprocket Support Fluid Passages (Case Cover Side)
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 358

Callout	Component Name
1	Left Scavenge Suction
1	Left Scavenge Suction
1	Left Scavenge Suction
1	Left Scavenge Suction
2	Right Scavenge Suction
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
5	Sump
6	Line

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

6	Line
6	Line
9	Lube 2
9	Lube 2
16	Lube
20	Actuator Feed
20	Actuator Feed
20	Actuator Feed
27	Primary Accumulator
27	Primary Accumulator
27	Primary Accumulator
32	Reverse
32	Reverse
33	Reverse Clutch
33	Reverse Clutch
39	2nd Clutch
39	2nd Clutch
40	3rd Clutch
40	3rd Clutch
40	3rd Clutch
40	3rd Clutch
42	Orificed 3rd Clutch
52	Exhaust
54	Drain
55	Overflow
56	Void

2006 Buick Lucerne CXS

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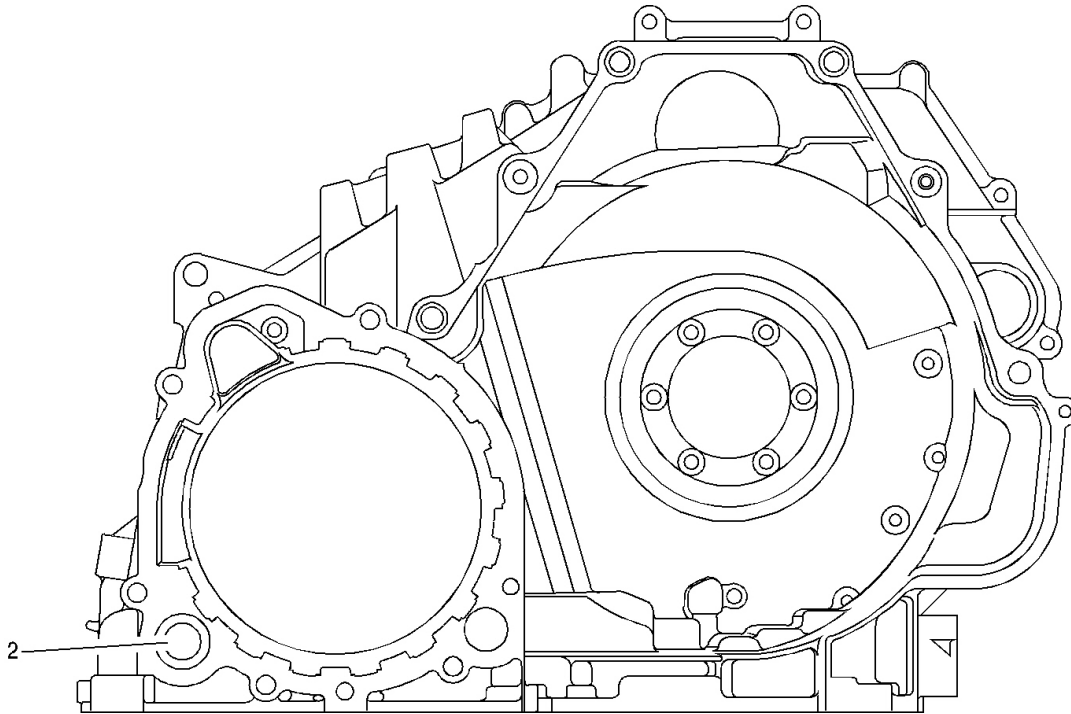


Fig. 359: Case Fluid Passages (Case Extension Side)
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 359

Callout	Component Name
2	Right Scavenge Suction

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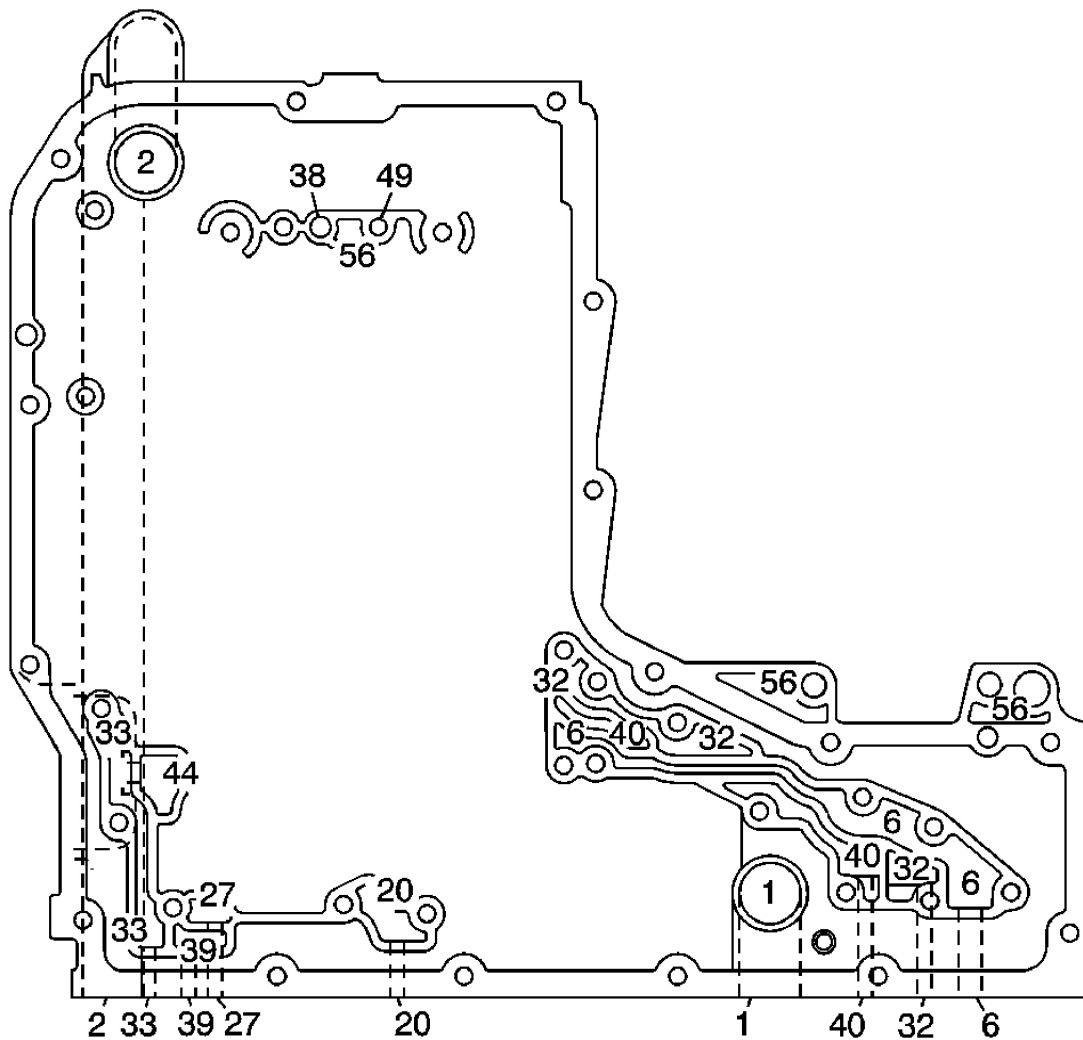


Fig. 360: Case Fluid Passages (Lower Channel Plate Side)
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 360

Callout	Component Name
1	Left Scavenge Suction
2	Right Scavenge Suction
6	Line
20	Actuator Feed
27	Primary Accumulator
32	Reverse
33	Reverse Clutch

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--

38	Forward Clutch
39	2nd Clutch
40	3rd Clutch
44	4th Band
49	Coast Clutch
56	Void

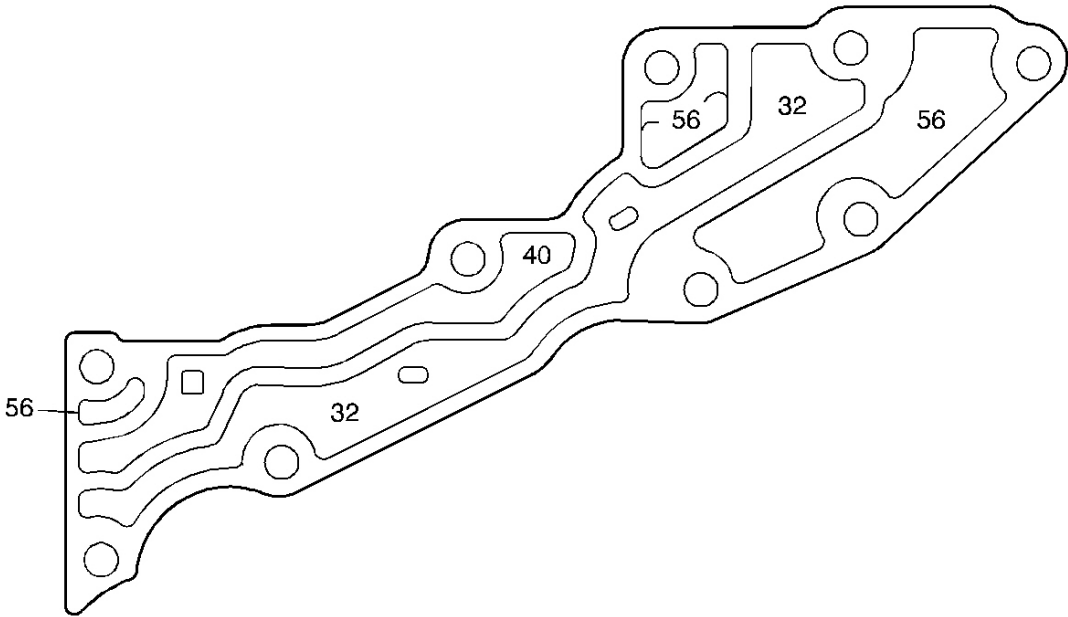


Fig. 361: Transfer Plate Fluid Passages (Case Bottom Side)
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 361

Callout	Component Name
32	Reverse
32	Reverse
40	3rd Clutch
56	Void
56	Void
56	Void

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS



Callout	Component Name
6	Line
17	PRN
20	Actuator Feed
21	Filtered Actuator Feed
23	Solenoid A
24	Solenoid B
26	Reverse Band
27	Primary Accumulator
28	3-4 Accumulator
29	1-2 Accumulator
32	Reverse
33	Reverse Clutch
34	Drive

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

35	Low Feed
36	Low
37	Low and Reverse Band Reduce
38	Forward Clutch
39	2nd Clutch
40	3rd Clutch
43	4th Band Feed
44	4th Band
47	D321
48	Coast Clutch Feed
49	Coast Clutch
50	D21
51	D21Y
53	Orificed Exhaust
56	Void

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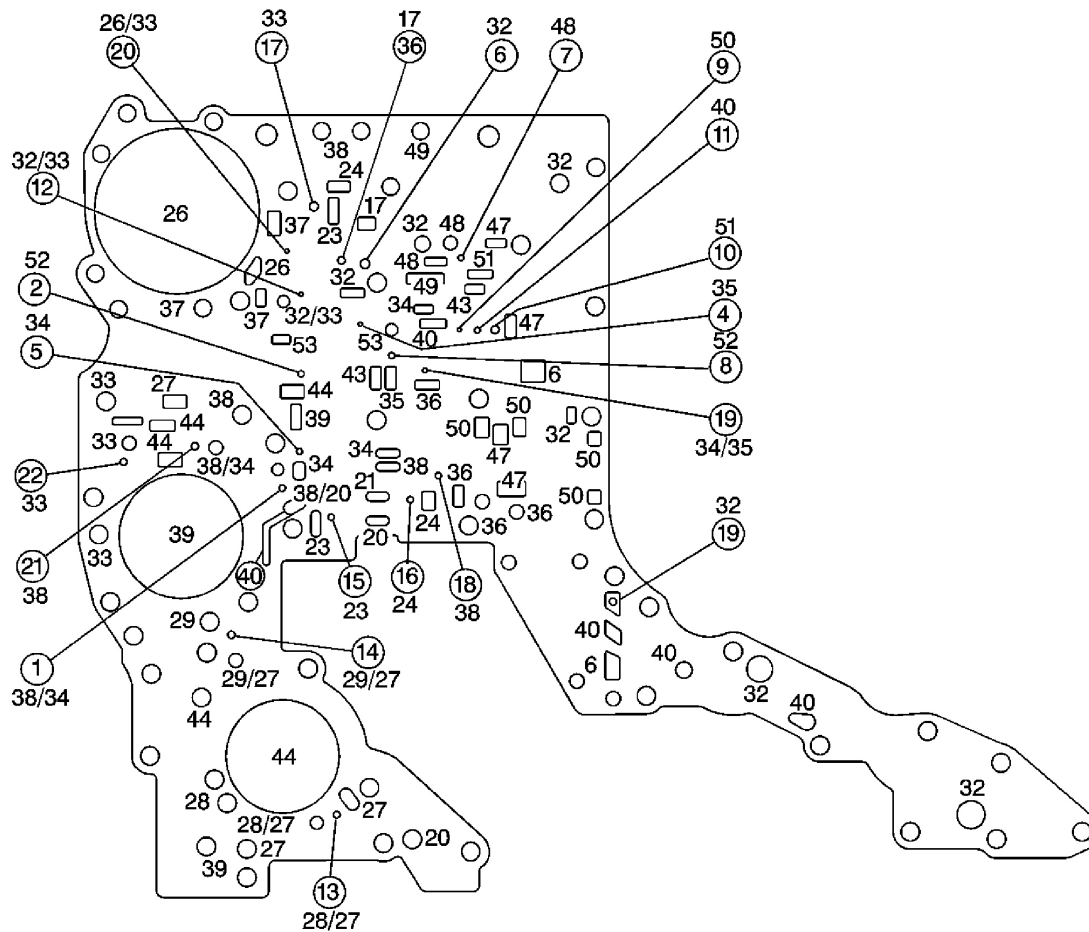


Fig. 363: Spacer Plate and Gasket Assembly Fluid Passages (Lower Control Valve Body to Channel Plate)

Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 363

Callout	Component Name
1	Metered Orifice
6	Line
17	PRN
17	PRN
20	Actuator Feed
21	Filtered Actuator Feed
23	Solenoid A
24	Solenoid B
26	Reverse Band

2006 Buick Lucerne CXS

2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS

32	Reverse
34	Drive
35	Low Feed
36	Low
38	Forward Clutch
39	2nd Clutch
39	2nd Clutch
40	3rd Clutch
43	4th Band Feed
44	4th Band
47	D321
48	Coast Clutch Feed
49	Coast Clutch
50	D21
51	D21Y
52	Exhaust
53	Orificed Exhaust

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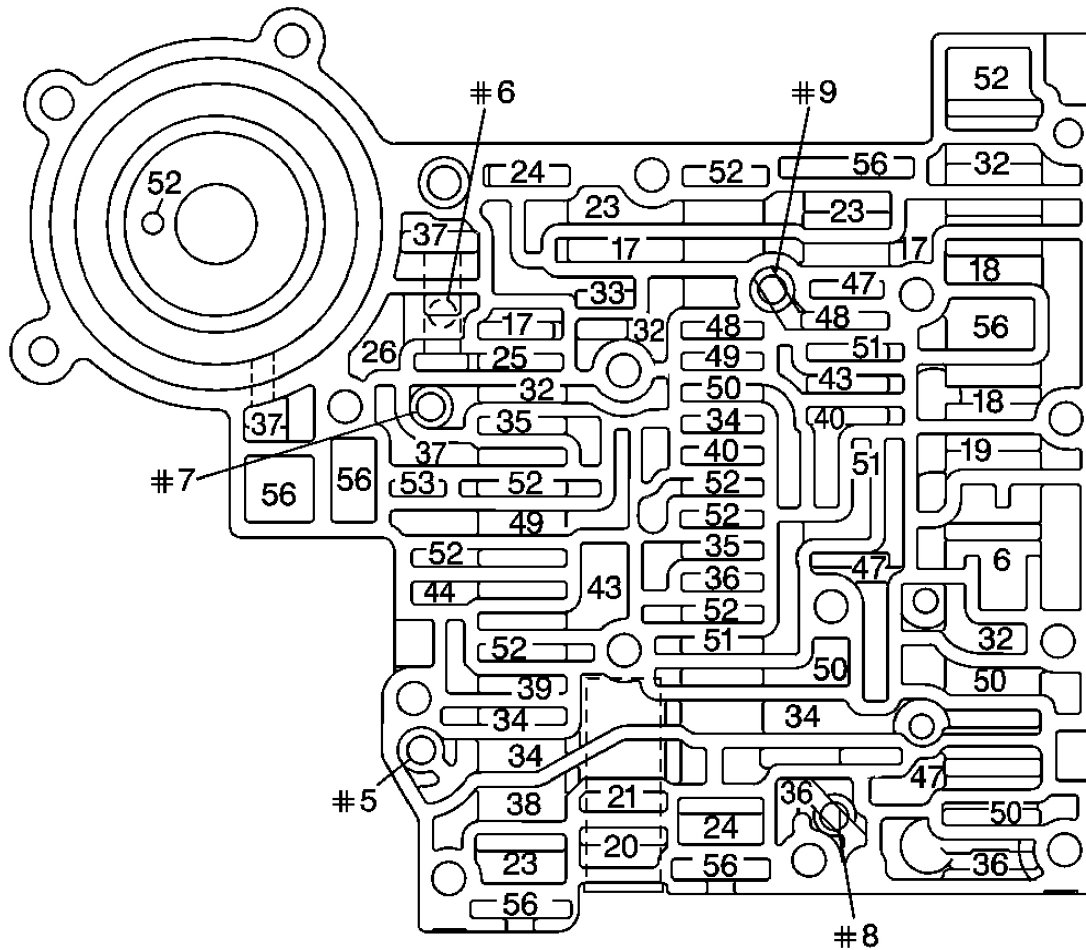


Fig. 364: Lower Control Valve Body Fluid Passages (Lower Channel Plate Side)
 Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 364

Callout	Component Name
6	Line
17	PRN
18	PRND4
19	PRND43
20	Actuator Feed
21	Filtered Actuator
23	Solenoid A
24	Solenoid B
25	Low and Reverse Band Apply

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26	Reverse Band
32	Reverse
34	Drive
35	Low Feed
36	Low
37	Low and Reverse Band Reduce
38	Forward Clutch
39	2nd Clutch
40	3rd Clutch
43	4th Band Feed
44	4th Band
47	D321
48	Coast Clutch Feed
49	Coast Clutch
50	D21
51	D21Y
52	Exhaust
56	Void

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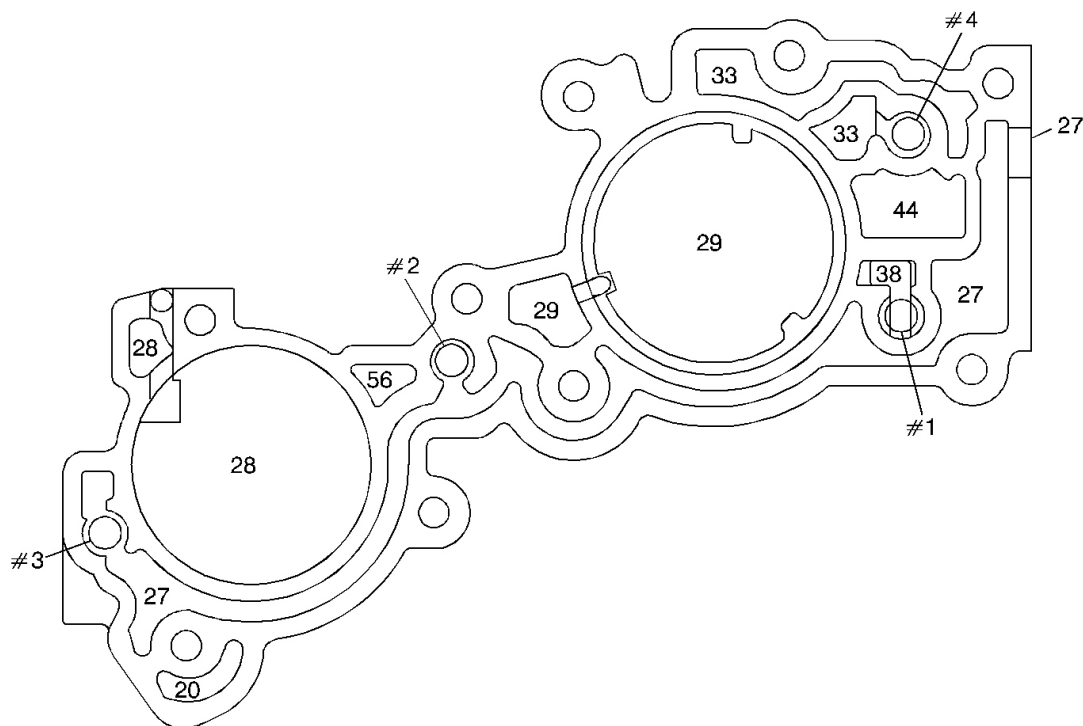


Fig. 365: Accumulator Housing Fluid Passages (Lower Channel Plate Side)
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 365

Callout	Component Name
27	Primary Accumulator
28	3-4 Accumulator
29	1-2 Accumulator
33	Reverse Clutch
38	Forward Clutch
44	4th Band
56	Void

SPECIAL TOOLS AND EQUIPMENT

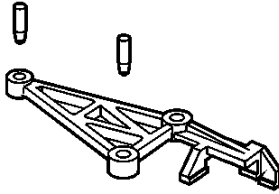
SPECIAL TOOLS

Special Tools

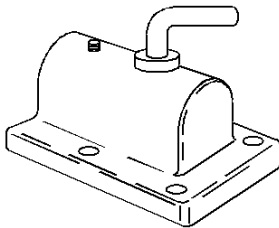
Illustration	Tool Number/Description

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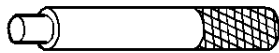
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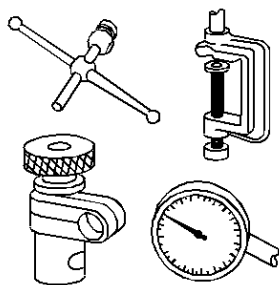
DT 47707-R1
IMS Alignment Tool



J 3289-20
Transmission Holding Fixture Base



J 7079-2
Universal Driver Handle-Non Threaded

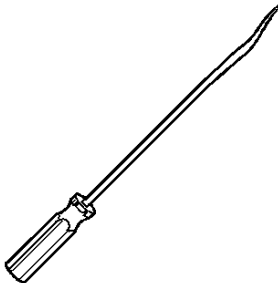
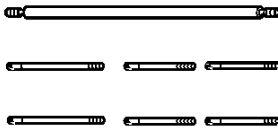
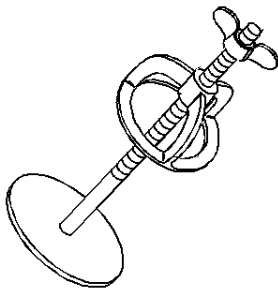
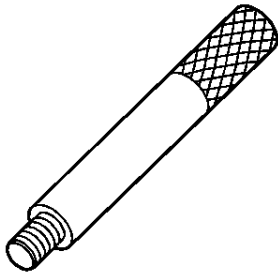


J 8001
Dial Indicator Set

J 8092
Driver Handle

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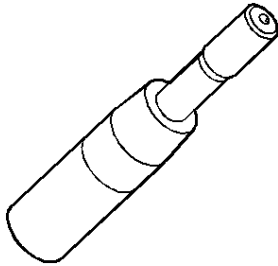
J 23327
Forward Clutch Spring Compressor Adaptor

J 25025-7A
Dial Indicator Post

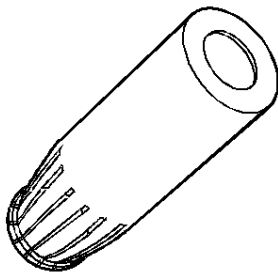
J 28585
Snap Ring Remover

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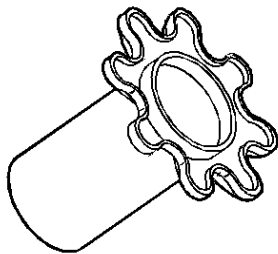
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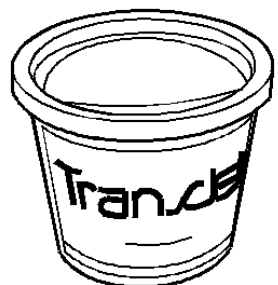
J 34741-1
Input Shaft Seal Installer - Protector



J 34741-2
Input Shaft Seal Installer - Pusher



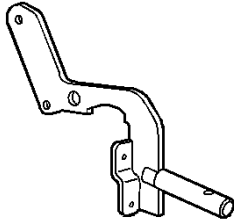
J 34741-3
Input Shaft Seal Installer - Sizer



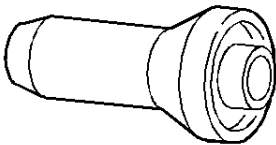
J 36850
Assembly Lubricant

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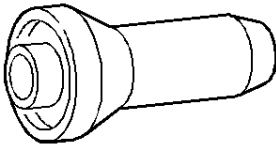
2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS



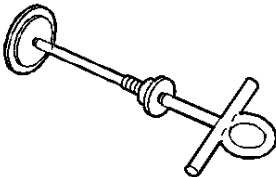
J 39050
4T80-E Holding Fixture



J 39051-1
Right Axle Seal Installer



J 39051-2
Left Axle Seal Installer

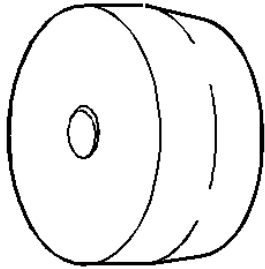
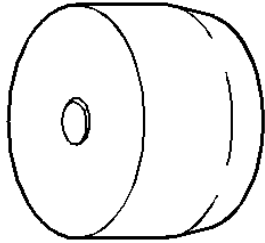


J 39053
Forward/Coast Clutch Assembly
Remover/Installer

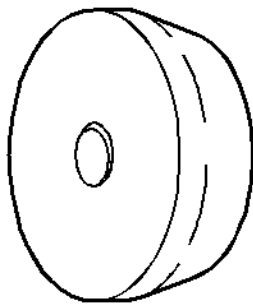
J 39054
Reverse Clutch Seal Protector

2006 Buick Lucerne CXS

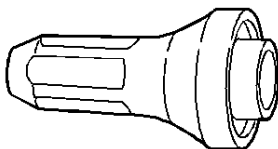
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J 39055
Forward Clutch Inner Seal Protector



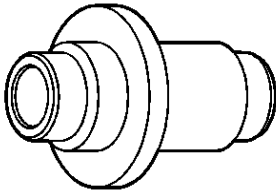
J 39056
Coast Clutch Seal Protector



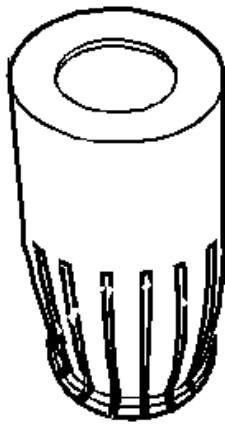
J 39061
Converter Seal Installer

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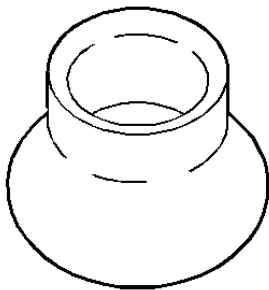
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J 39062
Case Cover to Turbine Shaft Seal
Remover/Installer



J 39064-1
Drive Sprocket Shaft Seal Installer - Pusher

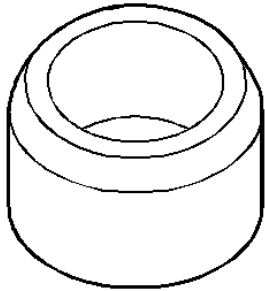


J 39064-2
Drive Sprocket Shaft Seal Installer - Sizer

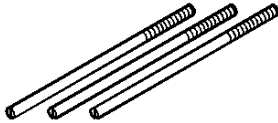
J 39064-3

2006 Buick Lucerne CXS

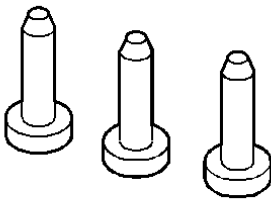
2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS



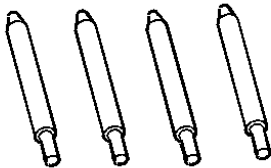
Drive Sprocket Shaft Seal Installer -
Protector



J 39068
Pump Assembly Guide Pins



J 39630-1
Lower Control/Valve Body Gasket Guide
Pins

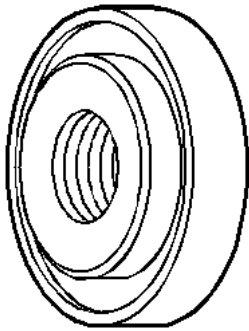


J 39630-2
Lower Control/Valve Body Gasket Guide
Pins

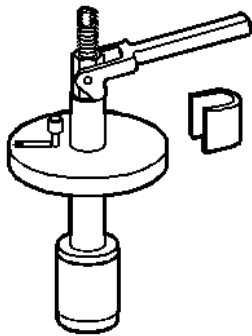
J 39648

2006 Buick Lucerne CXS

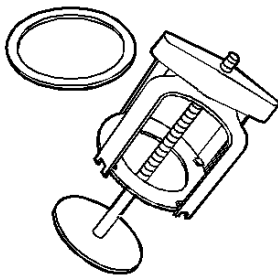
2006 TRANSMISSION Automatic Transaxle - 4T80-E - Overhaul - DTS



Case Cover to Drive Sprocket Seal Installer



J 39686
Input End Play Inspection Tool



J 39694
Clutch Compressor Adaptors